

START

0011351

Meeting Minutes Transmittal - Approved

Unit Managers Meeting
304 CONCRETION FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington

Meeting Held November 22, 1994
From 10:00 am to 11:30 am

Via video teleconference

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Unit Managers Meeting.

Date: Ellen Mattlin
6-1-95
Ellen M. Mattlin, Unit Manager, RL

Not Present

Date: _____
Daniel L. Duncan, RCRA Program Manager, EPA Region 10

Date: Scott E. McKinney
5/23/95
Scott E. McKinney, Unit Manager, Washington State Department of Ecology

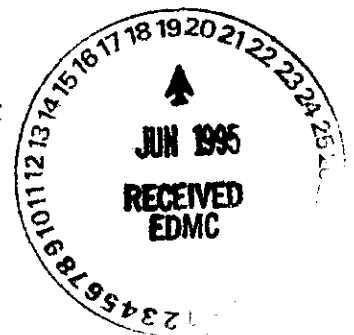
304 Concretion Facility, WHC Concurrence

Date: Fred A. Ruck III
6/1/95
Fred A. Ruck III, Contractor Representative, WHC

Date: Ivan L. Metcalf
6/6/95
Ivan L. Metcalf, Contractor Representative, WHC

Purpose: Discuss Permitting Process

Meeting Minutes are attached. The minutes are comprised of the following:



- Attachment 1 - Agenda
- Attachment 2 - Summary of Discussion and Commitments/Agreements
- Attachment 3 - Attendance List
- Attachment 4 - Action Items
- Attachment 5 - Analytical Results, Drum of dirt for electrical trench excavations
- Attachment 6 - Radiation Survey Results, electrical trench excavations
- Attachment 7 - Ecology Guidance on concrete sampling
- Attachment 8 - Ecology Comments of October 13, 1994, with responses.
- Attachment 9 - Phase I Sampling and Analysis Plan for the 304 Concretion Facility Closure Activities

Attachment 1

Unit Managers Meeting 304 CONCRETION FACILITY FEDERAL BUILDING, RM 784-A Richland, Washington

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

Agenda

1. Approval of Past UMM Minutes
2. Status Action Items
 - 9-23-94:1 Letter on NODs (Ecology)
 - 9-23-94:3 Answer tour questions (WHC)
 - 10-13-94:1 Report on disposition of the decon rags (WHC)
 - 10-13-94:2 Confirm that perchloroethylene is the same compound as tetrachloroethylene (WHC)
 - 10-13-94:3 Ethyl acetate (WHC)
 - 10-13-94:4 Guidance on sampling concrete for VOA (Ecology)
3. Status Closure Activities
 - Status of Ecology's Review of Closure Plan Revision 2
 - Status of Decontamination/Sampling Activities
 - Status of Sampling Analysis Plan
4. New Business
5. Set Next Meeting Date

Attachment 2

**Unit Managers Meeting
304 CONCRETION FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

Summary of Discussion and Commitments/Agreements

1. Approval of Past UMM Minutes

The August 25, 1994, September 23, 1994, and October 13, 1994 meeting minutes have not been reviewed or approved.

2. Status Action Items

9-23-94:1 Prepare a letter closing out previous NODs and transmitting this last NOD comment. Ecology (S. E. McKinney)

Ecology has not been able to prepare the letter by the due date of November 22, 1994. See "Status of Ecology's Review of Closure Plan Revision 2" for a complete discussion of this issues.

This action remains open.

9-23-94:3 Provide answers to Ecology's questions from the 304 Facility tour. WHC (J. G. Adler)

In response to Ecology's questions on the dirt removed from the electrical trench excavations and containerized for radiological concerns: WHC (J. A. Remaize) reported that the dirt has also been analyzed for heavy metals and none were detected. The analytical results requested by Ecology are attached (attachment 5). This implies that there may be less heavy metal contamination in the soil at the 304 Facility than originally feared.

In response to Ecology's request for any radiation survey results from the electrical trench excavations: WHC (J. L. Wright) reported that the survey results for the trench within the 304 Facility boundary came back as negative. That is, all survey results were at the detection levels of the instruments (below 5,000 DPM). The survey results are attached (attachment 6).

This action item is now closed.

**10-13-94:1 Report on the disposition of the decon rags.
WHC (J. L. Wright)**

WHC (J. L. Wright) reported that the decontamination rags will be disposed of according to the designation used for the material (mostly semi-consolidated cement) removed from the sump. This is consistent with the procedures outlined in Environmental Investigations and Site Characterization Manual WHC-CM-7-7 procedures for investigation derived waste. The resulting designation is expected to be for a radioactive mixed waste.

Ecology (S. E. McKinney) asked what was the total amount of waste from the decontamination activities. WHC responded that there are three 55-gal drums: one drum of rags and assorted clothing from the decontamination effort, one drum of clothes from the sump clean-out, and one drum of debris (dirt and concrete) from the sump clean-out.

This action item is now closed.

10-13-94:2 Confirm that perchloroethylene is the same compound as tetrachloroethylene. WHC (J. G. Adler)

WHC (J. G. Adler) reported that a check of several references confirmed that both perchloroethylene and tetrachloroethylene are the same compound, $\text{H}_2\text{C}:\text{CH}_2$, Chemical Abstract Service (CAS) Number 126-18-4. For revision 3 of the closure plan, the Table 7-2 will be revised to drop perchloroethylene and add a foot note indicating that they are the same chemical compound.

This action item is now closed.

10-13-94:3 Try and identify why ethyl acetate was left off and if it should be added to the SAP. WHC (J. G. Adler)

WHC (J. G. Adler) reported that a review of the DQO meeting minutes suggest that the group failed to identify ethyl acetate as a U-listed waste. Ethyl acetate has been added back into revision 1 of the SAP.

This action item is now closed.

**10-13-94:4 Provide comments on the SAP relative to Ecology's guidance on sampling concrete for volatile organics.
Ecology (S.E. McKinney)**

Ecology (S. E. McKinney) provided guidance to WHC on November 2, 1992 to reduce the number of concrete organic samples in the sampling plan. A copy of the guidance is attached (attachment 7).

This action item is now closed.

3. Status Closure Activities

- Status of Ecology's Review of Closure Plan Revision 2

Ecology (S. E. McKinney) stated that the close-out letter had not been started yet. Ecology expressed concern that when Ecology's planned priority work through December had been set-up, Ecology was not able to include the 304 Facility close-out letter as part of that work-load.

- Status of Decontamination/Sampling Activities

WHC (J. G. Adler) stated that there have been no changes in the status of the decontamination or sampling activities at the 304 Facility since the last meeting. The decontamination is complete and sampling will be scheduled to start when the Sampling and Analysis Plan is approved by Ecology.

- Status of Sampling Analysis Plan

WHC (J. G. Adler) reported that the Ecology comments from the last UMM had been addressed. A handout with the Ecology comments and WHC responses is attached (attachment 8)

A copy of the final draft sampling and analysis plan (SAP) for the 304 Facility had been sent via express mail to Ecology. This copy is identical to the revision 1 of the SAP (attachment 9) that was approved for public release short before this Unit Manager's Meeting. A copy of the final revision 1 of the SAP will be sent to Ecology via next-day mail.

RL/WHC request verbal approval of the SAP, followed by written approval, from Ecology as soon as possible.

There is one change from the draft red-line copy provide to Ecology earlier in the month. In the analysis for methyl ethyl ketone, the analytical method has been changed from SW-846 Method 8015 to Method 8240. The primary driver is that the WHC 222-S Laboratory does not have a 8015 procedure in place while they have an 8240.

Start of sampling depends upon 2 things: Ecology's approval of the SAP and a modification to the existing laboratory contract. The modification is needed to add SW-846 Method 8260. The exact date that this will be completed is not known at this time, but is expected to occur during the week of December 5th or December 12th. Provided that Ecology approval is granted and that the contract modification is in place, sampling could start as early as the week of December 5th. However, the week of December 12th is considered more likely.

Ecology stated that if sampling is occurring during the tentatively scheduled UMM during December 13, 1994, then Ecology would like to observe the sampling. WHC reported that an Ecology visit would not be

a problem and that RL/WHC would keep Ecology informed on when sampling will occur.

4. New Business

Use of Debris Rule for Closure

Ecology (S. E. McKinney) and RL (E. M. Mattlin)/WHC (J. G. Adler/F. A. Ruck III) briefly discussed the use of the 'Debris Rule' for use in the closure of facilities like the 304 Concretion Facility. All parties consider that there is great potential for use of the debris rule. However, several issues still need to be resolved or investigated. Some of these issues include cost of disposal of mixed waste, air permitting concerns, funding, and appropriate equipment. WHC will be continuing its examination of the debris rule and is working to determine when and where it could be applied.

5. Set Next Meeting Date

The next Unit Manager's Meeting has been tentatively scheduled for December 13, 1994 in Richland, WA.

Unit Managers Meeting
304 CONCRETION FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington

Via video teleconference

[illegible]

Attachment 4

**Unit Managers Meeting
304 CONCRETION FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

Action Items

<u>Action Item #</u>	<u>Description</u>
9-23-94:1 OPEN	Prepare a letter closing out previous NODs and transmitting this last NOD comment. Ecology (S. E. McKinney)
9-23-94:3 CLOSED 11/22/94	Provide answers to Ecology's questions from the 304 Facility tour. WHC (J. G. Adler)
10-13-94:1 CLOSED 11/22/94	Report on the disposition of the decon rags. WHC (J. L. Wright)
10-13-94:2 CLOSED 11/22/94	Confirm that perchloroethylene is the same compound as tetrachloroethylene. WHC (J. G. Adler)
10-13-94:3 CLOSED 11/22/94	Try and identify why ethyl acetate was left off and if it should be added to the SAP. Due date Friday, 10/21/94. WHC (J. G. Adler)
10-13-94:4 CLOSED 11/22/94	Provide comments on the SAP relative to Ecology's guidance on sampling concrete for volatile organics. Due date Friday, 10/21/94. Ecology (S. E. McKinney)

Attachment 5

**Unit Managers Meeting
303-K STORAGE FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

TITLE - Analytical Results, Drum of dirt for electrical trench excavations



18938 120th Avenue N.E., Suite 101 • Ullrich, WA 98011-9545 (206) 461-9700 • FAX 465-2992
 101 11115 Montgomery, Suite D • Spokane, WA 99208 4778 (509) 924-3700 • FAX 924-9290
 5405 S.W. Northern Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Battelle Pacific NW Laboratories	Client Project ID: Kaiser Engineers Hanford	Sampled: Oct 20, 1994
P.O. Box 999, M/S P8-45	Sample Descript: 303-A TRENCH	Received: Oct 25, 1994
Richland, WA 99352	Analysis Method: EPA 1311/6010/7000	TCLP Ext: Oct 24, 1994
Attention: Sam Juracich	Sample Number: 410-1400	Analyzed: Oct 26-27, 1994
		Reported: Oct 27, 1994

TCLP Extraction Metals

Analyte	Regulatory Level mg/L (ppm)	Reporting Limit mg/L (ppm)	Sample Results mg/L (ppm)
Arsenic.....	5.0	0.20	N.D.
Barium.....	100	1.0	N.D.
Cadmium.....	1.0	0.0050	N.D.
Chromium.....	5.0	0.010	N.D.
Cobalt.....	5.0	0.10	N.D.
Mercury.....	0.20	0.0010	N.D.
Selenium.....	1.0	0.15	N.D.
Silver.....	5.0	0.020	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.


 Matthew T. Essig
 Project Manager

4101400.BHW <1>

Attachment 6

**Unit Managers Meeting
303-K STORAGE FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

TITLE - Radiation Survey Results, electrical trench excavations

RADIATION SURVEY REPORT	Date 5-25-94	Time From 0800 To 1515	Survey Number 165986	FC J	Page 1 of 2
	Bldg 303 A, 304	Area 300	Room N/A		

Description of Job

Coverage of Power City digging between 303 A & 304. Job was shut down before any dirt was hauled away. This was because direct contamination was discovered embedded in the asphalt.

RWP No. N/A

Location Between Buildings

Check if appropriate. When checked, do not place unrelated information on this record

- | | |
|---|--|
| <input type="checkbox"/> Personnel Contamination | <input type="checkbox"/> High Radiation Level Work |
| <input type="checkbox"/> CAM/Radiation Alarm | <input checked="" type="checkbox"/> "Special Survey" |
| <input type="checkbox"/> Establish Dose Rates | <input type="checkbox"/> Property Release |
| <input type="checkbox"/> Radiation/Contamination Incident | <input type="checkbox"/> RAM Shipment |

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
1		Asphalt surveyed								4000	500	<1000	<20	—
2		Bucket of back hole								<1000	<20	<1000	<20	—
3		Shovel & Broom Surveyed								<1000	<20			
4		Bed of dump truck								<1000	<20	<1000	<20	—
5		All personnel surveyed								<1000	<20			
6		Dose Rate when temp												
		RCA was set up	0.5	0.5	F	1	<0.5	<0.5						

1. Check for personnel dose rate. () Continued on supplemental report form

Instrument(s) Used	<input checked="" type="checkbox"/> CP	<input checked="" type="checkbox"/> G.M. Pancake	<input checked="" type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No (s)	6641	1539	1204	2961		

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
			WBP	S	E
			WBP	S	E
			WBP	S	E

Respiratory Protection Worn

- ☐ Supplied Air
☐ Filter
☐ Other _____
☒ None

RPT Exposure N/A	Work Location Code N/A	Signed J. J. Eberhart
		PR No 6A714

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side

Did you attend a pre-job meeting for this work?

☐ N/A ☒ No ☐ Yes

Reviewed By

Date



Date 7/19/94	Time From 0730 To 1530	Survey Number No 179127	F.C. R	Page 1 of 2
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Bldg. 3713 303A

Area 300

Room N/A _____

Description of Job	
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Digging by 37B ^{SEAN/WH} 7/14/13
and 303A

44 HC - JP - 0718

3.1.1

RWP No. 12-045


Location _____

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ High Radiation Level Work

☐ CAM/Radiation Alarm

 "Special Survey"

☐ Establish Dose Rates

☐ Property Release☐ Radiation/Contamination Incident☐ RAM Shipment[illegible]

1 Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input checked="" type="checkbox"/> ^{CF-10} G-M/Pancake	<input checked="" type="checkbox"/> PAM 7	<input checked="" type="checkbox"/> ⁴ gm l)	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)		1566 1346	2406	1487 38		

Respiratory Protection Worn

☐ Supplied Air☐ Filter☐ Other _____☐ None

Loris Heller

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying
			WBP S E
			WBP S E
			WBP S E

RPT Exposure

Work Location Code

Signed

PR No. 772 MP/V3/6131

Did you increase or reduce RWP requirements for this work?

Did you attend a pre-job meeting for this work?

Reviewed By

Date _____

☐ No ☒ Yes Explain on reverse side.

☐ N/A ☐ No ☒ Yes

I H. T. M.

BF 6060 010 (10/90)

RADIATION SURVEY REPORT (cont.)

Survey Number
N^o 179127

F.C.

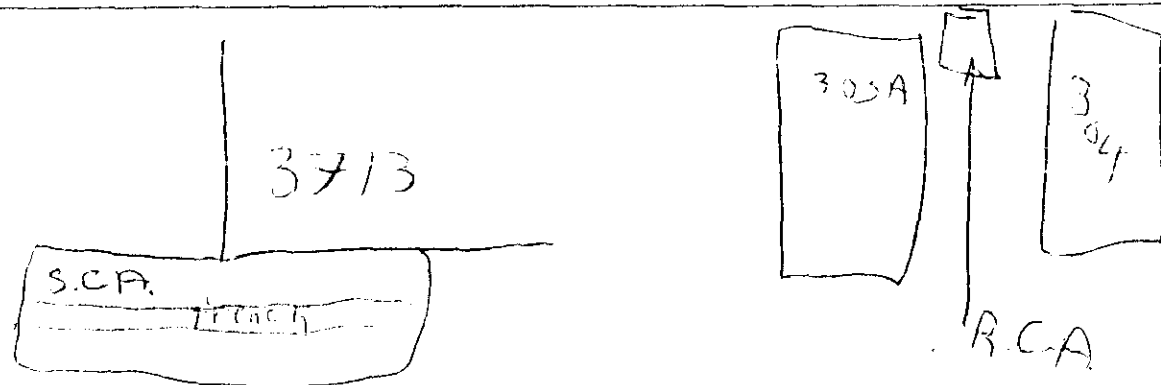
Page **2** of **2**

Further Descriptions, Data, and Comment

Finished digging by 3713. moved to 303A. Surveyed ²⁸¹ 3/19/84
 pieces of blacktop. most \approx 9090 hrd up to 4000 c/m direct on them

~~N/A~~

DIAGRAMS OR SKETCHES



ADDITIONAL REPORTS COMPLETED

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

~~N/A~~

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.

~~N/A~~



**Westinghouse
Hanford Company**

Date _____

7-21-94

Time

From 1515 To 1540

Survey Number	Survey Date	Survey Time	Survey Location	Survey Description	Survey Results
1	1/1/2020	10:00	1000	1000	1000
2	1/1/2020	10:00	1000	1000	1000
3	1/1/2020	10:00	1000	1000	1000
4	1/1/2020	10:00	1000	1000	1000
5	1/1/2020	10:00	1000	1000	1000
6	1/1/2020	10:00	1000	1000	1000
7	1/1/2020	10:00	1000	1000	1000
8	1/1/2020	10:00	1000	1000	1000
9	1/1/2020	10:00	1000	1000	1000
10	1/1/2020	10:00	1000	1000	1000
11	1/1/2020	10:00	1000	1000	1000
12	1/1/2020	10:00	1000	1000	1000
13	1/1/2020	10:00	1000	1000	1000
14	1/1/2020	10:00	1000	1000	1000
15	1/1/2020	10:00	1000	1000	1000
16	1/1/2020	10:00	1000	1000	1000
17	1/1/2020	10:00	1000	1000	1000
18	1/1/2020	10:00	1000	1000	1000
19	1/1/2020	10:00	1000	1000	1000
20	1/1/2020	10:00	1000	1000	1000
21	1/1/2020	10:00	1000	1000	1000
22	1/1/2020	10:00	1000	1000	1000
23	1/1/2020	10:00	1000	1000	1000
24	1/1/2020	10:00	1000	1000	1000
25	1/1/2020	10:00	1000	1000	1000
26	1/1/2020	10:00	1000	1000	1000
27	1/1/2020	10:00	1000	1000	1000
28	1/1/2020	10:00	1000	1000	1000
29	1/1/2020	10:00	1000	1000	1000
30	1/1/2020	10:00	1000	1000	1000
31	1/1/2020	10:00	1000	1000	1000
32	1/1/2020	10:00	1000	1000	1000
33	1/1/2020	10:00	1000	1000	1000
34	1/1/2020	10:00	1000	1000	1000
35	1/1/2020	10:00	1000	1000	1000
36	1/1/2020	10:00	1000	1000	1000
37	1/1/2020	10:00	1000	1000	1000
38	1/1/2020	10:00	1000	1000	1000
39	1/1/2020	10:00	1000	1000	1000
40	1/1/2020	10:00	1000	1000	1000
41	1/1/2020	10:00	1000	1000	1000
42	1/1/2020	10:00	1000	1000	1000
43	1/1/2020	10:00	1000	1000	1000
44	1/1/2020	10:00	1000	1000	1000
45	1/1/2020	10:00	1000	1000	1000
46	1/1/2020	10:00	1000	1000	1000
47	1/1/2020	10:00	1000	1000	1000
48	1/1/2020	10:00	1000	1000	1000
49	1/1/2020	10:00	1000	1000	1000
50	1/1/2020	10:00	1000	1000	1000
51	1/1/2020	10:00	1000	1000	1000
52	1/1/2020	10:00	1000	1000	1000
53	1/1/2020	10:00	1000	1000	1000
54	1/1/2020	10:00	1000	1000	1000
55	1/1/2020	10:00	1000	1000	1000
56	1/1/2020	10:00	1000	1000	1000
57	1/1/2020	10:00	1000	1000	1000
58	1/1/2020	10:00	1000		

Nº 179148

F.C.

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Page / of 2

RADIATION SURVEY REPORT

Bldg.

Behind 303-K

Area

300

Room

Description of Job

Recovery tag site Behind
303-K. A piece Banner.

WAC - 1P-0718 3.1.1

RWP No. *14*

Location *Behind 303x - RCA*

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination☐ CAM/Radiation Alarm☐ Establish Dose Rates☐ Radiation/Contamination Incident☐ High Radiation Level Work☒ "Special Survey"

☐ Property Release

☐ RAM Shipment[illegible]

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used		<input checked="" type="checkbox"/> CP	<input checked="" type="checkbox"/> G-M/Pancake	<input checked="" type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Respiratory Protection Worn	
Serial No.(s)		0901 / 1395		2901				<input type="checkbox"/> Supplied Air <input type="checkbox"/> Filter <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> None	
ESTIMATED PERSONNEL DOSE RATES									
Phase of Work		Based on Measurement(s)		Average Dose Rate		Limit Applying			
1st						WBP S E			
						WBP S E			
						WBP S E			
RPT Exposure				Work Location Code				Signed	
0				MA				L. Miller / J. Miller	
Did you increase or reduce RWP requirements for this work?				Did you attend a pre-job meeting for this work?				PR No.	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Explain on reverse side.				<input checked="" type="checkbox"/> N/A <input type="checkbox"/> No <input type="checkbox"/> Yes				54925	
								Reviewed By	
								H.T. Miller	
								Date	
								8/8/94	

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179148

F.C.

R

Page 12 of 2

Further Descriptions, Data, and Comment

checked the dirt piles - and replaced the Red Construction Banner to prevent any one falling into the hole.
 Wrote a DSI to Supervisor of my concern from a safety stand point.
 BS CF = 10%
 L CF = 7%

DIAGRAMS OR SKETCHES

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log



Westinghouse
Hanford Company

RADIATION SURVEY REPORT

Date

7/27/94

Time

From 0730 To 1600

Survey Number

No 179167

F.C.

R

Page 1 of 1

Bldg.

3213, 303A

Area

300

Room

2/A

Description of Job

Digging @ 3213

Reduce SCA to underground

Radioactive Material Area

made RCA by 303A to 95A WTC - ID-071831A

RWP No. R-045

Location

2/A

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ CAM/Radiation Alarm

☐ Establish Dose Rates

☐ Radiation/Contamination Incident

☐ High Radiation Level Work

☒ "Special Survey"

☐ Property Release

☐ RAM Shipment

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
										beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
1	1	dirt @ 3213	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4100	220	4100	220	N/A
2	1	dirt @ 303A	↓	↓	↓	↓	↓	↓	↓	1500	220	1500	520	↓
N/A	N/A	<div>10</div> <div>9</div> <div>8</div> <div>7</div> <div>6</div> <div>5</div> <div>4</div> <div>3</div> <div>2</div> <div>1</div>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
↓	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
↓	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
↓	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
↓	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
N/A	N/A		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input checked="" type="checkbox"/> CP	<input type="checkbox"/> G-M/Pancake	<input type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)		182 321	2848			

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying
			WBP S E
			WBP S E
			WBP S E

Respiratory Protection Worn

☐ Supplied Air

☐ Filter

☐ Other

☒ None

RPT Exposure

Work Location Code

Signed

PR No.

Reviewed By

Date

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☐ N/A ☐ No ☒ Yes

Larry Heller
67302

RADIATION SURVEY REPORT (cont.)

Survey Number

No 179167

F.C.

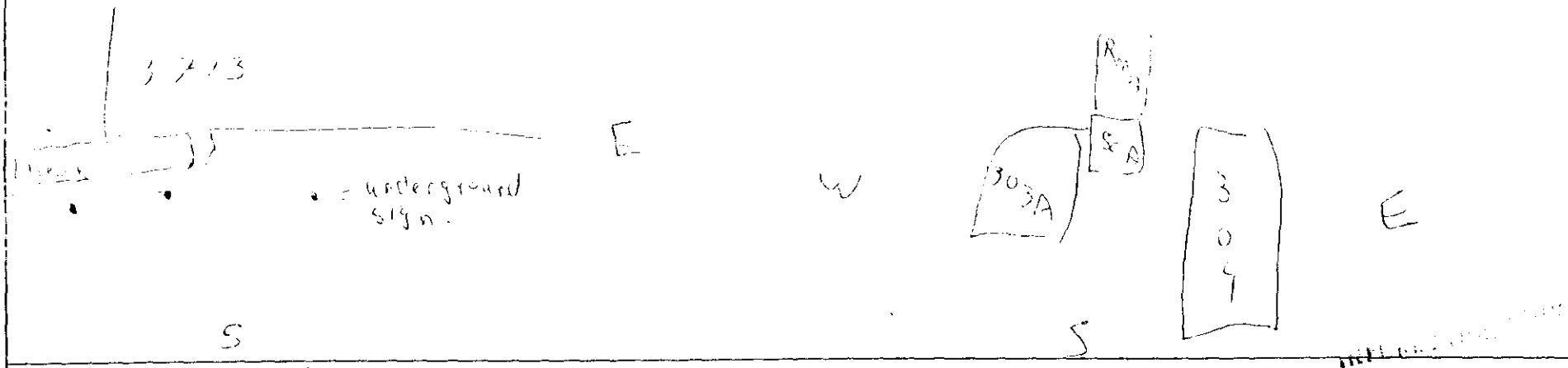
A

Page 2 of 2

Further Descriptions, Data, and Comment

Reduced SCA on South end of 3213 to underground Rad. Material.
Upgraded R.C.A. @ 303A to a SCA because of contamination of 150 c/m found

DIAGRAMS OR SKETCHES



ADDITIONAL REPORTS COMPLETED

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

~~W~~
~~A~~

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.

~~A~~



8/4/94

From 0730 To 1600

№ 179208

R

Page 1 of 1

Bldg. 303A, 3705

300

Time of Day	Sleeping	Sedentary	Light	Moderate	Vigorous
00:00	80	15	5	0	0
02:00	85	10	5	0	0
04:00	85	10	5	0	0
06:00	85	15	5	0	0
08:00	75	35	10	5	0
10:00	65	40	15	10	0
12:00	55	45	15	10	5
14:00	45	40	15	10	5
16:00	35	35	15	10	5
18:00	25	30	15	10	5
20:00	15	25	15	10	5
22:00	10	20	15	10	5
24:00	5	15	10	5	0


Coverage of Moe Construction

RWP No. 12-045

Location

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination☐ High Radiation Level Work☐ CAM/Radiation Alarm

 "Special Survey"

☐ Establish Dose Rates

☐ Property Release

☐ Radiation/Contamination Incident☐ RAM Shipment[illegible]

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input type="checkbox"/> G-M/Pancake	<input type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Respiratory Protection Worn
Serial No.(s)		173-084	2461				<input type="checkbox"/> Supplied Air

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying
			WBP S E
			WBP S E
			WBP S E

☐ Filter
☐ Other _____
☒ None

19613 H2/13

RPT Exposure

Work Location Code

Signed

PR No. 77-116-200

Did you increase or reduce RWP requirements for this work?

Did you attend a pre-job meeting for this work?

Reviewed By _____

Date _____

☒ No ☐ Yes Explain on reverse side.

☒ N/A ☐ No ☐ Yes

Finished digging hole @ 303A for vaults. Moved to Kaiser All craft building, North side. Went from building to street.

2/17

A hand-drawn diagram of a rectangular structure, possibly a building or a field. The structure is divided into several sections by lines. The top section is labeled 'Hole' and contains a small square. The bottom section is labeled '41' and contains a small square. The left side is labeled '1/2' and the right side is labeled '1/2'.

~~10~~

Log No.

10. *Journal of the American Statistical Association*, 1997, 92, 1033-1046.

11



Westinghouse
Hanford Company

Date

8/15/94

Time

From 0730 To 1600

Survey Number

No 179233

F.C.

R

Page 1 of 2

RADIATION SURVEY REPORT

Bldg.

3706

Area

300

Room

N/A

Description of Job

Coverage of Kaiser labors

digging hole for conduct

4/10-1P-0718-3.1.1

RWP No.

N/A

Location

N/A

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ High Radiation Level Work

☐ CAM/Radiation Alarm

☒ "Special Survey"

☐ Establish Dose Rates

☐ Property Release

☐ Radiation/Contamination Incident

☐ RAM Shipment

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron nrem/hr	Direct (dpm)		Smear 100 cm ²		
1		soil samples	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21000	220	21000	220	N/A
2		soil								21000	220	21000	220	
3		soil								21000	220	21000	220	
4		soil								21000	220	21000	220	
5		soil								21000	220	21000	220	
6		soil								21000	220	21000	220	
7		soil								21000	220	21000	220	
8		soil								21000	220	21000	220	
9		soil								21000	220	21000	220	
10		soil								21000	220	21000	220	

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input type="checkbox"/> G-M/Pancake	<input type="checkbox"/> PAM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)	1357	1692				

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying
			WBP S E
			WBP S E
			WBP S E

Respiratory Protection Worn

☐ Supplied Air

☐ Filter

☐ Other

☒ None

RPT Exposure

Work Location Code

Signed

PR No.

6-302

Did you increase or reduce RWP requirements for this work?

☐ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☐ N/A ☐ No ☒ Yes

Reviewed By

J. T. MILLER

Date

RADIATION SURVEY REPORT (cont.)

Survey Number
N^o 179233

F.C.
R

Page **7** of **2**

Further Descriptions, Data, and Comment

pull up 3 soil samples that will go to 2023 labs later.
 surveyed soil piles.

DIAGRAMS OR SKETCHES

N/A

ADDITIONAL REPORTS COMPLETED

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

N/A

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.

N/A

9513347.1264

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179292

F.C.

[Signature]

Page 2 of 2

Further Descriptions, Data, and Comment

DIAGRAMS OR SKETCHES

N/A

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.

9513347-1266



Date 9-8-94	Time From 0800 To 1515	Survey Number No 179316	F.C. R	Page 1 of 2
----------------	---------------------------	----------------------------	-----------	-------------

 ν/A

300

2/1

Description of Job

RWP No.

n/A

Location

Between
304 & 303. A

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ CAM/Radiation Alarm☐ Establish Dose Rates☐ Radiation/Contamination Incident☐ High Radiation Level Work

☒ "Special Survey"

☐ Property Release

☐ RAM Shipment[illegible]

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input checked="" type="checkbox"/> G-M/Pancake	<input type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)		1387 1692				

Respiratory Protection Worn

☐ Supplied Air☐ Filter☐ Other☒ None

~~INFORMATION ONLY~~

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
/	N/A	/	WBP	S	E
			WBP	S	E
			WBP	S	E

RPT Exposure

✓A

Work Location Code

$$N/A$$

Signed

PR No.

2f Erlenbusch erlenbusch
6A714

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre job meeting for this work?

☐ N/A ☒ No ☐ Yes

Reviewed By

U.H.I.M

Date _____

1. 2. 3.



Westinghouse
Hanford Company

RADIATION SURVEY REPORT

Date

9/12/94

Time

From 0730 To 1000

Survey Number

No 179330

F.C.

R

Page 1 of 2

Bldg.

303K

Area

300

Room

N/A

Description of Job

PIPE construction digging
north of 303K Perimeter

RWP No. R-045

Location North of 303K

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ CAM/Radiation Alarm

☐ Establish Dose Rates

☐ Radiation/Contamination Incident

☐ High Radiation Level Work

☒ "Special Survey"

☐ Property Release

☐ RAM Shipment

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
										beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
1		Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	450	4500	420	420	N/A
2		Area of metal tank cover								300	3000	10	100	
3		Area of metal tank cover								10	10	N/A	N/A	
4		Area								N/A	N/A			
5		Area												
6		Area												
7		Area												
8		Area												
9		Area												
10		Area												
11		Area												
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42		Area												
43		Area												
44		Area												
45		Area												
46		Area												
47		Area												
48		Area												
49		Area												
50		Area												

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s)
Used

☐ CP

☒ G-M/Pancake

☒ PAM

☐

☐

☒

Serial No.(s)

2475

Respiratory Protection Worn

☐ Supplied Air

☐ Filter

☐ Other

☒ None

INFORMATION ONLY

By: Heiler

RPT Exposure

Work Location Code

Signed

PR No. Boris Miller

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☒ N/A ☐ No ☐ Yes

Reviewed By

Heiler

Date

10/6/94

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179330

F.C.

Page 2 of 2

Further Descriptions, Data, and Comment

Found a piece of metal that may be some kind of plate attached to a telephone pole. Also found what left it on old telephone pole. Had 320 cpm on it. Removed contamination and bagged from for proper disposal.

DIAGRAMS OR SKETCHES

N/A

INFORMATION ONLY

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

~~N/A~~

Log No.

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

~~N/A~~



Westinghouse
Hanford Company

Date

9-21-94

Time

From 0800 To 1515

Survey Number

N^o 179364

F.C.

R

Page 1 of 2

RADIATION SURVEY REPORT

Bldg.

N/A

Area

300

Room

N/A

Description of Job

RWP No.

N/A

Location

N. of 303-K

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ High Radiation Level Work

☐ CAM/Radiation Alarm

☒ "Special Survey"

☐ Establish Dose Rates

☐ Property Release

☐ Radiation/Contamination Incident

☐ RAM Shipment

Coverage of Mue construction digging
electrical trench through underground
RAM area. WHC-0218 Appen 1-3.1

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
1		Dirt in trench								beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
2		Personnel Surveyed								< 5000				
3		Shovels & Pick								< 5000				

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input checked="" type="checkbox"/> CF-10 G-M/Pancake	<input type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)		1344 738				

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
	N/A		WBP	S	E
			WBP	S	E
			WBP	S	E

Respiratory Protection Worn

☐ Supplied Air

☐ Filter

☐ Other

☒ None

INFORMATION ONLY

RPT Exposure

N/A

Work Location Code

N/A

Signed *Eileen Bush*

PR No. 64714

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☐ N/A ☐ No ☐ Yes

Reviewed By

Eileen Bush

Date

10/5/94

9513647-124



Description of Job

9-23-94

From 0900 To 1515

Nº 179374

✓

Page 1 of 2

Between 304 & 303A

300

2/18

RWP No. 218

Location	N 7
----------	--------

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ CAM/Radiation Alarm

☐ Establish Dose Rates

☐ Radiation/Contamination Incident☐ High Radiation Level Work☒ "Special Survey"☐ Property Release

☐ RAM Shipment


[illegible]

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP	<input type="checkbox"/> G-M/Pancake	<input type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)						

Respiratory Protection Worn

☐ Supplied Air

 Filter

☐ Other☒ None

INFORMATION ONLY

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
/	NA	/	WBP	S	E
			WBP	S	E
			WBP	S	E

RPT Exposure

✓A

Work Location Code

N/A

Signed

PR No. 6A714

Reviewed By

Date _____

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☒ N/A ☐ No ☐ Yes

Reviewed By

B-Spec

Date
10/5/19

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179419

F.C.

R

Page 2 of 2

Further Descriptions, Data, and Comment

2 kg. avg. 100 c/m Bx

DIAGRAMS OR SKETCHES

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.

INFORMATION ONLY

[illegible]

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179422

F.C.

R

Page 2 of 2

Further Descriptions, Data, and Comment

The dirt from 303A dig site is a suspect & is placed in an SCA. & will be taken care of later - The dirt was covered w/ plastic (1/2 and more plastic will arrive to finish the plot.)

DIAGRAMS OR SKETCHES

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Log No.



RADIATION SURVEY REPORT

Date 10/7/94 Time From 0800 To 1600 Survey Number **No 179433** F.C. R Page 1 of 2

Bldg. Area 300 Room

Description of Job

COVERAGE OF DIG SITE

RWP No. R-045

Location NORTH OF 304

Check if appropriate. When checked, do not place unrelated information on this record.

- | | |
|---|--|
| <input type="checkbox"/> Personnel Contamination | <input type="checkbox"/> High Radiation Level Work |
| <input type="checkbox"/> CAM/Radiation Alarm | <input checked="" type="checkbox"/> "Special Survey" |
| <input type="checkbox"/> Establish Dose Rates | <input type="checkbox"/> Property Release |
| <input type="checkbox"/> Radiation/Contamination Incident | <input type="checkbox"/> RAM Shipment |

WHC-IP-0718 7200 3.1.1 REV 0 / 3.1 REV 0

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
										beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
1		DIRT REMOVED								<D	<D			
2		DUMP TRUCK								<D	<D	<D	<D	
3		BACK HOE								<D	<D	<D	<D	
4		EQUIPMENT								<D	<D	<D	<D	
5		PERSONNEL								<D	<D			
6		WORK AREA								<D	<D			

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP /	<input checked="" type="checkbox"/> G-M/Pancake	<input checked="" type="checkbox"/> PAM	<input type="checkbox"/> /	<input type="checkbox"/> /	<input type="checkbox"/> /
Serial No.(s)	<u>1</u>	<u>1915</u> <u>338</u>	<u>2437</u>	<u> </u>	<u> </u>	<u> </u>

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
<u>NA</u>	<u>NA</u>	<u>NA</u>	WBP	S	E
<u>NA</u>	<u>NA</u>	<u>NA</u>	WBP	S	E
<u>NA</u>	<u>NA</u>	<u>NA</u>	WBP	S	E

Respiratory Protection Worn

- ☐ Supplied Air
☐ Filter
☐ Other
☒ None

C. W. WILDMAN

RPT Exposure <u> </u>	Work Location Code <u> </u>	Signed <u> </u> PR No. <u>95837</u>
Did you increase or reduce RWP requirements for this work? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Explain on reverse side.	Did you attend a pre-job meeting for this work? <input checked="" type="checkbox"/> N/A <input type="checkbox"/> No <input type="checkbox"/> Yes	Reviewed By <u>HT Miller</u> <u>JS Miller</u> Date <u>10/10/94</u>

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179433

F.C.

R

Page 2 of 2

Further Descriptions, Data, and Comment

- SCA WAS REDUCED AFTER SURVEY
- BACK HOE WAS RELEASED FROM SCA
- NO PROBLEMS ENCOUNTERED

DIAGRAMS OR SKETCHES

INSTRUMENTATION

The α correction factor for the PAM is 7

The β correction factor for the ECM/F-11 is 10

DEFINITION FOR $\leq D$ AS FOLLOWS:

REMOVABLE ACTIVITY:

$\leq D = < 1000 \text{ dpm}/100 \text{ cm}^2 \beta$

$\leq D = < 20 \text{ dpm}/100 \text{ cm}^2 \alpha$

DIRECT MEASURED ACTIVITY:

$\leq D = < 5000 \text{ dpm}/100 \text{ cm}^2 \beta$ fixed and removable

$\leq D = < 500 \text{ dpm}/100 \text{ cm}^2 \alpha$ fixed and removable

HPT INITIALS

ca

INFORMATION

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log



Date 10/10/94	Time From 0730 To 1530	Survey Number 179497	E.C. R	Page 1 of 2
Bldg. —	Area 300	Room Infrared Pro. Spec. Spectrophotometer		

Description of Job

COVERAGE OF W.G. MOE DIGGING TRENCH

WHC-2P-0718 PROCEDURE 3.1.1 REV 0

Location NORTH OF 304

<input type="checkbox"/> Personnel Contamination	<input type="checkbox"/> High Radiation Level Work
<input type="checkbox"/> CAM/Radiation Alarm	<input checked="" type="checkbox"/> "Special Survey"
<input type="checkbox"/> Establish Dose Rates	<input type="checkbox"/> Property Release
<input type="checkbox"/> Radiation/Contamination Incident	<input type="checkbox"/> RAM Shipment

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
										beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
1		DIRT				/				<D	<D			
2		EQUIPMENT & TOOLS				/				<D	<D	<D	<D	
3		BACK HOE				/				<D	<D	<D	<D	DO NOT TO BE CHARGED
4		PERSONNEL				/				<D	<D			
						/								
						/								
						/								
						/								

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input type="checkbox"/> CP /	<input checked="" type="checkbox"/> G-M/Pancake	<input checked="" type="checkbox"/> PAM	<input type="checkbox"/> /	<input type="checkbox"/> /	<input type="checkbox"/> /
Serial No.(s)	/	1755 803	2899	/	/	/

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
\sqrt{A}	\sqrt{A}	\sqrt{A}	WBP	S	E
\sqrt{A}	\sqrt{A}	\sqrt{A}	WBP	S	E
			WBP	S	E

Respiratory Protection Worn

☐ Supplied Air

 Filter

☐ Other☒ None (no more than 10% of total)

C. W. WILDMAN

RPT Exposure

Work Location Code

Signed

PR No. 9583

Did you increase or reduce RWP requirements for this work?

Did you attend a pre-job meeting for this work?

Reviewed By

Date _____

☒ No ☐ Yes Explain on reverse side.

☒ N/A ☐ No ☐ Yes

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179437

F.C.

R

Page 2 of 2

Further Descriptions, Data, and Comment

- NO CONTAMINATION DETECTED DURING DIGGING TODAY

DIAGRAMS OR SKETCHES

INSTRUMENTATION

The α correction factor for the PAM is 7

The β correction factor for the EGM/P-11 is 10

DEFINITION FOR α D AS FOLLOWS:

REMOVABLE ACTIVITY:

α D = < 1000 dpm/100 cm^2 β

α D = < 20 dpm/100 cm^2 α

DIRECT MEASURED ACTIVITY:

α D = < 5000 dpm/100 cm^2 β , fixed and removable

α D = < 500 dpm/100 cm^2 α , fixed and removable

HPT INITIALS

C

INFORMATION ONLY

ADDITIONAL REPORTS COMPLETED

Log No.

Log No.

Radiological Problem Report

Onsite Radioactive Shipment

Skin Contamination Survey

Offsite Radioactive Shipment

Personnel Effects Contamination Report

Routine Radioactive Shipment

Radiation Survey Report

Sample Counter Log



Westinghouse
Hanford Company

Date

10/14/94

Time

From 0730 To 1530

Survey Number

N^o 179461

F.C.

R

Page 1 of 2

RADIATION SURVEY REPORT

Bldg.

Area

300

Room

Description of Job

COVERAGE FOR W6 MOE DIGGING

TRENCHES AND PLACING ASPHALT

IN DRUMS

WHC-IP-0718 PROCEDURE 3.1. REV 0

RWP No. R-045

Location NORTH OF 304

Check if appropriate. When checked, do not place unrelated information on this record.

☐ Personnel Contamination

☐ High Radiation Level Work

☐ CAM/Radiation Alarm

☒ "Special Survey"

☐ Establish Dose Rates

☐ Property Release

☐ Radiation/Contamination Incident

☐ RAM Shipment

Item No.	P E R (1)	Description of Work Performed, Radiation Controls, and Measurements	Meter Deflection		Dist.	C.F.	DOSE RATE			CONTAMINATION LEVELS				
			W/O	W/C			beta (non pen) mrad/hr	gamma (pen) mR/hr	neutron mrem/hr	Direct (dpm)		Smear 100 cm ²		
										beta	alpha	beta (d/m)	alpha (d/m)	mrad/hr
1		TRENCHES								<D				
2		DIRT								<D				
3		TOOLS & EQUIPMENT								<D	<D	<D	<D	
4		PERSONNEL								<D	<D			
5		DRUMS FILLED	10.1							<D	<D	<D	<D	
6		WORK AREA								<D	<D			

1. Check for personnel dose rate ☐ Continued on supplemental report form.

Instrument(s) Used	<input checked="" type="checkbox"/> CP	<input checked="" type="checkbox"/> G-M/Pancake	<input checked="" type="checkbox"/> PAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial No.(s)	6209	1755 803	2475			

ESTIMATED PERSONNEL DOSE RATES

Phase of Work	Based on Measurement(s)	Average Dose Rate	Limit Applying		
N/A	N/A	N/A	WBP	S	E
			WBP	S	E
			WBP	S	E

Respiratory Protection Worn

☐ Supplied Air

☐ Filter

☐ Other

☒ None

C. W. WILDMAN

RPT Exposure

Work Location Code

Signed

PR No. 95837

Did you increase or reduce RWP requirements for this work?

☒ No ☐ Yes Explain on reverse side.

Did you attend a pre-job meeting for this work?

☒ N/A ☐ No ☐ Yes

Reviewed By

Date

RADIATION SURVEY REPORT (cont.)

Survey Number

N^o 179461

F.C.

R

Page 2 of 2

Further Descriptions, Data, and Comment

- DRUMMED UP (11) 55 GAL BARRELS WITH ASPHALT.
- NO CONTAMINATION DETECTED IN TRENCH WORK
- DRUMS MOVED TO RMA NORTH OF 303K

DIAGRAMS OR SKETCHES

INSTRUMENTATION

The α correction factor for the PAM is 7

The β correction factor for the EGM/P 11 is 10

DEFINITION FOR CD AS FOLLOWS:

REMOVABLE ACTIVITY:

$\leq D = < 1000 \text{ dpm}/100 \text{ cm}^2 \beta \gamma$

$\leq D = < 20 \text{ dpm}/100 \text{ cm}^2 \alpha$

DIRECT MEASURED ACTIVITY:

$\leq D = 10000 \text{ dpm}/100 \text{ cm}^2 \beta \gamma$ fixed and removable

$\leq D = < 500 \text{ dpm}/100 \text{ cm}^2 \alpha$ fixed and removable

HPT INITIALS

CS

ADDITIONAL REPORTS COMPLETED

Log No.

Radiological Problem Report

Skin Contamination Survey

Personnel Effects Contamination Report

Radiation Survey Report

Log No.

Onsite Radioactive Shipment

Offsite Radioactive Shipment

Routine Radioactive Shipment

Sample Counter Log

Attachment 7

**Unit Managers Meeting
303-K STORAGE FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

TITLE - Ecology Guidance on concrete sampling

**SAMPLING FOR ORGANICS IN CONCRETE
ECOLOGY GUIDANCE OF NOVEMBER 2, 1994**

On November 2, 1994, Ecology (S. E. McKinney) provided the following guidance via cc-mail:

The number of concrete core organic samples can be reduced. The rationale for this is that the data from other sites indicates that volatile organics are not remaining in concrete, and therefore, it is unlikely that volatile organics will be found at the 304 Concretion Facility.

The concrete core organic samples will be collected from the following locations: the 4 authoritative floor sampling locations, 1 random floor sampling location, and 1 random outside storage pad sampling location.

If significant levels of volatile organics are found in either the pad or the floor, then the sampling scheme and closure strategy for the floor and/or pad will be re-assessed.

Attachment 8

**Unit Managers Meeting
303-K STORAGE FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

TITLE - Ecology Comments of October 13, 1994, with responses.

**304 FACILITY SAMPLING AND ANALYSIS PLAN
ECOLOGY COMMENTS OF OCTOBER 13, 1994**

1. ECOLOGY COMMENT, SAP Rev. 0, page 1, line 9: The text says that the plan "...provides guidance..." While the SAP is intended to be flexible, it needs to convey to the public that this is the plan to be followed. A stronger term than guidance is needed.

WHC RESPONSE: The text has been changed from "... provides guidance for..." to "...describes..."

2. ECOLOGY COMMENT, SAP Rev. 0, page 1, line 10: The text discusses a RCRA clean closure. This implies that the federal regulations have jurisdiction. This needs to be changed to indicate that Washington state regulations have jurisdiction.

WHC RESPONSE: The text has been changed from referencing RCRA to referencing WAC 173-303.

3. ECOLOGY COMMENT, SAP Rev. 0, page 19, line 3: Section header "6.1.1 Duplicate Samples" needs to be moved to the location between paragraphs.

WHC RESPONSE: The text has been changed.

4. ECOLOGY COMMENT, SAP Rev. 0, page 23, line 45: Has Ecology seen the WHC document *Preparation of Concrete for Volatile Organic Analysis* (LA-523-435)?

WHC RESPONSE: The document has not yet been transmitted to Ecology. It is being prepared in as part of the closure activities for the 300 Area Solvent Evaporator (Ecology Unit Manager is R. E. Cordts). As additional testing was needed to address internal concerns about the limitations of the procedure have delayed official transmittal to Ecology. Currently, a letter is being prepared for transmittal to Ecology that will address the procedure and the limitations associated with using the procedure. Completion is expected for some time in November.

5. ECOLOGY COMMENT, SAP Rev. 0, page 23, line 15: Why were perchloroethylene and ethyl acetate not included in the SAP?

WHC RESPONSE: Perchloroethylene and tetrachloroethylene are different names for the same chemical substance, $\text{Cl}_2\text{C}=\text{CCl}_2$, (Chemical Abstract Service (CAS) Number 127-18-4). At the DQO meeting of 5/31/94 to 6/1/94, it was agreed to drop perchloroethylene and to keep tetrachloroethylene.

At the DQO meeting of 5/31/94 to 6/1/94, the group failed to identify that ethyl acetate was a "U" listed waste (discarded chemical product). Ethyl acetate has been added back to the SAP.

6. ECOLOGY COMMENT, SAP Rev. 0, page 25, lines 15 to 30: This is a list of data validation package elements. Is the raw data going to be provided with the package? Are there two packages, one with and one without the raw data?

WHC RESPONSE: There will be one data validation package that includes the elements listed above and the raw data.

Attachment 9

**Unit Managers Meeting
303-K STORAGE FACILITY
FEDERAL BUILDING, RM 784-A
Richland, Washington**

**Meeting Held November 22, 1994
From 10:00 am to 11:30 am**

Via video teleconference

**TITLE - Phase I Sampling and Analysis Plan for the
304 Concretion Facility Closure Activities**

0039544

WHC-SD-EN-AP-177
Revision 1

Phase I Sampling and Analysis Plan for the 304 Concretion Facility Closure Activities

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management



Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **604151**

Proj.
ECN

2. ECN Category (mark one)		3. Originator's Name, Organization, MSIN, and Telephone No.		4. Date	
<input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void		J. G. Adler, 88210, H6-23, 376-7513		11/18/94	
		5. Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7. Approval Designator	
		304 Concretion Facility	304 Concretion Facility	E	
		8. Document Numbers Changed by this ECN (includes sheet no. and rev.)	9. Related ECN No(s).	10. Related PO No.	
		WHC-SD-EN-AP-177, Rev. 0	n/a	n/a	
11a. Modification Work		11b. Work Package No.	11c. Modification Work Complete		11d. Restored to Original Condition (Temp. or Standby ECN only)
<input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)		n/a	n/a		n/a
		Cog. Engineer Signature & Date		Cog. Engineer Signature & Date	
12. Description of Change					
Revision of SD to correct typographical errors and to incorporate comments from the Washington State Department of Ecology					
13a. Justification Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/>					
As-Found <input type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>					
13b. Justification Details					
14. Distribution (include name, MSIN, and no. of copies) * ADVANCE COPY					
* J. G. Adler H6-23 (1) F. A. Ruck H6-23 (1) J. L. Wright H6-23 (1) OSTI L8-07 (2) CENTRAL FILES L8-04					
RELEASE STAMP OFFICIAL RELEASE 21 BY WHC DATE NOV 22 1994 <i>Sta. 21</i>					

ENGINEERING CHANGE NOTICE

Page 2 of 2

604151

15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact: <table style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">ENGINEERING</th> <th colspan="2" style="text-align: center;">CONSTRUCTION</th> </tr> <tr> <td>Additional</td> <td><input type="checkbox"/> \$</td> <td>Additional</td> <td><input type="checkbox"/> \$</td> </tr> <tr> <td>Savings</td> <td><input type="checkbox"/> \$</td> <td>Savings</td> <td><input type="checkbox"/> \$</td> </tr> </table>	ENGINEERING		CONSTRUCTION		Additional	<input type="checkbox"/> \$	Additional	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$	17. Schedule Impact (days) Improvement <input type="checkbox"/> Delay <input type="checkbox"/>
ENGINEERING		CONSTRUCTION												
Additional	<input type="checkbox"/> \$	Additional	<input type="checkbox"/> \$											
Savings	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$											

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/>
Functional Design Criteria <input type="checkbox"/>	Stress/Design Report <input type="checkbox"/>	Health Physics Procedure <input type="checkbox"/>
Operating Specification <input type="checkbox"/>	Interface Control Drawing <input type="checkbox"/>	Spares Multiple Unit Listing <input type="checkbox"/>
Criticality Specification <input type="checkbox"/>	Calibration Procedure <input type="checkbox"/>	Test Procedures/Specification <input type="checkbox"/>
Conceptual Design Report <input type="checkbox"/>	Installation Procedure <input type="checkbox"/>	Component Index <input type="checkbox"/>
Equipment Spec. <input type="checkbox"/>	Maintenance Procedure <input type="checkbox"/>	ASME Coded Item <input type="checkbox"/>
Const. Spec. <input type="checkbox"/>	Engineering Procedure <input type="checkbox"/>	Human Factor Consideration <input type="checkbox"/>
Procurement Spec. <input type="checkbox"/>	Operating Instruction <input type="checkbox"/>	Computer Software <input type="checkbox"/>
Vendor Information <input type="checkbox"/>	Operating Procedure <input type="checkbox"/>	Electric Circuit Schedule <input type="checkbox"/>
OM Manual <input type="checkbox"/>	Operational Safety Requirement <input type="checkbox"/>	ICRS Procedure <input type="checkbox"/>
FSAR/SAR <input type="checkbox"/>	IEFD Drawing <input type="checkbox"/>	Process Control Manual/Plan <input type="checkbox"/>
Safety Equipment List <input type="checkbox"/>	Cell Arrangement Drawing <input type="checkbox"/>	Process Flow Chart <input type="checkbox"/>
Radiation Work Permit <input type="checkbox"/>	Essential Material Specification <input type="checkbox"/>	Purchase Requisition <input type="checkbox"/>
Environmental Impact Statement <input type="checkbox"/>	Fac. Proc. Samp. Schedule <input type="checkbox"/>	Tickler File <input type="checkbox"/>
Environmental Report <input type="checkbox"/>	Inspection Plan <input type="checkbox"/>	<input type="checkbox"/>
Environmental Permit <input type="checkbox"/>	Inventory Adjustment Request <input type="checkbox"/>	<input type="checkbox"/>

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. J. G. Adler <i>J. G. Adler</i>	<u>11/21/94</u>	PE	_____
Cog. Mgr. F. A. Ruck III <i>F. A. Ruck III</i>	<u>11/21/94</u>	QA	_____
QA	_____	Safety	_____
Safety	_____	Design	_____
Environ. F. A. Ruck III <i>F. A. Ruck III</i>	<u>11/21/94</u>	Environ.	_____
Other	_____	Other	_____
J. L. Wright <i>J. L. Wright via phone</i>	<u>11/21/94</u>	_____	_____
I. L. Metcalf <i>I. L. Metcalf via phone</i>	<u>11/19/94</u>	_____	_____
K. J. Young <i>K. J. Young via phone</i>	<u>11/22/94</u>	_____	_____
M. S. Hendrix <i>M. S. Hendrix</i>	<u>11/22/94</u>	_____	_____
_____	_____	DEPARTMENT OF ENERGY	_____
_____	_____	Signature or a Control Number that tracks the Approval Signature	_____
_____	_____	ADDITIONAL	_____
_____	_____	_____	_____
_____	_____	_____	_____

RELEASE AUTHORIZATION

Document Number: WHC-SD-EN-AP-177, Rev. 1

Document Title: PHASE I SAMPLING AND ANALYSIS FOR THE 304 CONCRETION
FACILITY CLOSURE ACTIVITY

Release Date: 11/21/94

This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

V. L. Birkland
V.L. Birkland

11/21/93

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SUPPORTING DOCUMENT

1. Total Pages 32

2. Title

PHASE I SAMPLING AND ANALYSIS PLAN FOR THE 304
CONCRETION FACILITY CLOSURE ACTIVITIES

3. Number

WHC-SD-EN-AP-177

4. Rev No.

1

5. Key Words

304 Concretion Facility
closure activities
analysis
sampling
quality control
data validation
concrete sampling

6. Author

Name: J. G. Adler

Signature

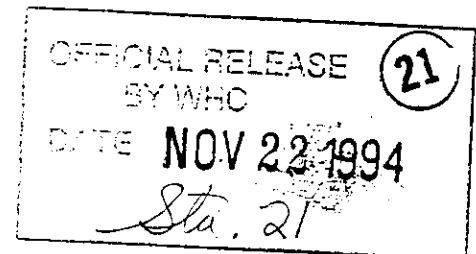
Organization/Charge Code 88210
TCPN: K345C

7. Abstract

This is the sample and analysis plan for the closure activities at the 304 Concretion Facility. This document supports the *304 Concretion Facility Closure Plan*, DOE/RL-90-03. The sampling and analysis plan identifies the sample locations, any special handling requirements, quality control samples, required chemical analysis, and data validation need to meet the requirements of the *304 Concretion Facility Closure Plan*.

8.

RELEASE STAMP



CONTENTS

1.0	PURPOSE	1
2.0	OBJECTIVE	1
3.0	SITE DESCRIPTION/BACKGROUND	2
4.0	SCOPE OF WORK	2
5.0	SAMPLING AND FIELD ACTIVITIES	2
6.0	QUALITY CONTROL SAMPLES	18
7.0	LABORATORY ANALYSIS	23
8.0	DATA VALIDATION	25
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ATTACHMENT

1	Metric Conversion Chart	Att-1
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2	304 Concretion Facility, Authoritative Concrete Core and Soil Sample Locations in Areas of Potential Contamination	4
3	304 Concretion Facility, Building Floor Concrete Core Sampling Locations	7
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6	304 Concretion Facility, North Wall Wipe Sample Locations	10
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2	Summary of 304 Concretion Facility Routine and Quality Control Samples	19

PHASE I SAMPLING AND ANALYSIS PLAN FOR THE 304 CONCRETION FACILITY CLOSURE ACTIVITIES

1.0 PURPOSE

This document describes the initial (Phase I) sampling and analysis activities associated with the proposed clean closure of the 304 Concretion Facility under the *Washington Administrative Code* (WAC) 173-303-610, "Dangerous Waste Regulations". This is a supplement to *304 Concretion Facility Closure Plan* (DOE-RL 1993a), and should be used in conjunction with the *Environmental Investigations and Site Characterization Manual* (WHC 1988) for specific procedures.

The strategy for clean closure of the 304 Concretion Facility is to decontaminate, sample (Phase I sampling), and evaluate results. If the evaluation indicates that a limited area requires additional decontamination for clean closure, the limited area will be decontaminated, resampled (Phase II sampling), and the result evaluated. If the evaluation indicates that the constituents of concern are below action levels, the facility will be clean closed. Or, if the evaluation indicates that the constituents of concern are present above action levels, the condition of the facility will be evaluated and appropriate action taken.

The action levels are defined as the concentrations of dangerous waste constituents above the Hanford Site background concentrations identified in *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE-RL 1993b) and above the residential concentrations identified in *Model Toxics Control Act* [WAC 173-340] residential levels.

The criteria used to develop the sample locations, analytical methods, quality control methodology, and data validation methodology were based on the contents of Revision 2 of the *304 Concretion Facility Closure Plan* (DOE-RL 1993a) and further developed during the Data Quality Objectives Meetings held on May 30, June 1, and August 25, 1994, and in the monthly Unit Manager Meetings held during 1994.

2.0 OBJECTIVE

The objective is to facilitate a RCRA clean closure of the site by verifying that decontamination has reduced the concentrations of all constituents of concern to below action levels. This objective will be met by collecting samples from 37 locations. The samples will then be analyzed to determine the levels of the constituents of concern.

3.0 SITE DESCRIPTION/BACKGROUND

The 304 Concretion Facility is located in the northwest corner of the 300 Area. The layout of the facility is shown in Figures 1 and 2. The facility consists of a building, an associated changeroom, and an external storage area. The building is a steel framed building with sheet metal sides and a poured concrete floor. There is no interior insulation or wallboard. The ceiling of the facility consists of exposed steel trusses (girders). The floor area has a drainage trench, a floor drain, and a sump area. The changeroom is metal with a concrete floor and the interior walls and ceiling are covered with wallboard and insulated. The storage area consists of a concrete pad surrounded by asphalt. The building is also surrounded by an asphalt strip.

The 304 Concretion Facility has performed a variety of functions. From construction in 1952 until the mid-1960's, the facility housed the pilot plants associated with cladding uranium cores. From the mid-1960's until 1971, the facility was used to store engineering equipment and product chemicals. From 1972 until 1994, the facility was used to treat low-level radioactive mixed waste, recyclable scrap uranium generated during nuclear fuel fabrication processes or development activities, and uranium-titanium alloy chips and fines. Also, the facility was used for the repackaging of spent halogenated solvents from the nuclear fuels manufacturing process.

4.0 SCOPE OF WORK

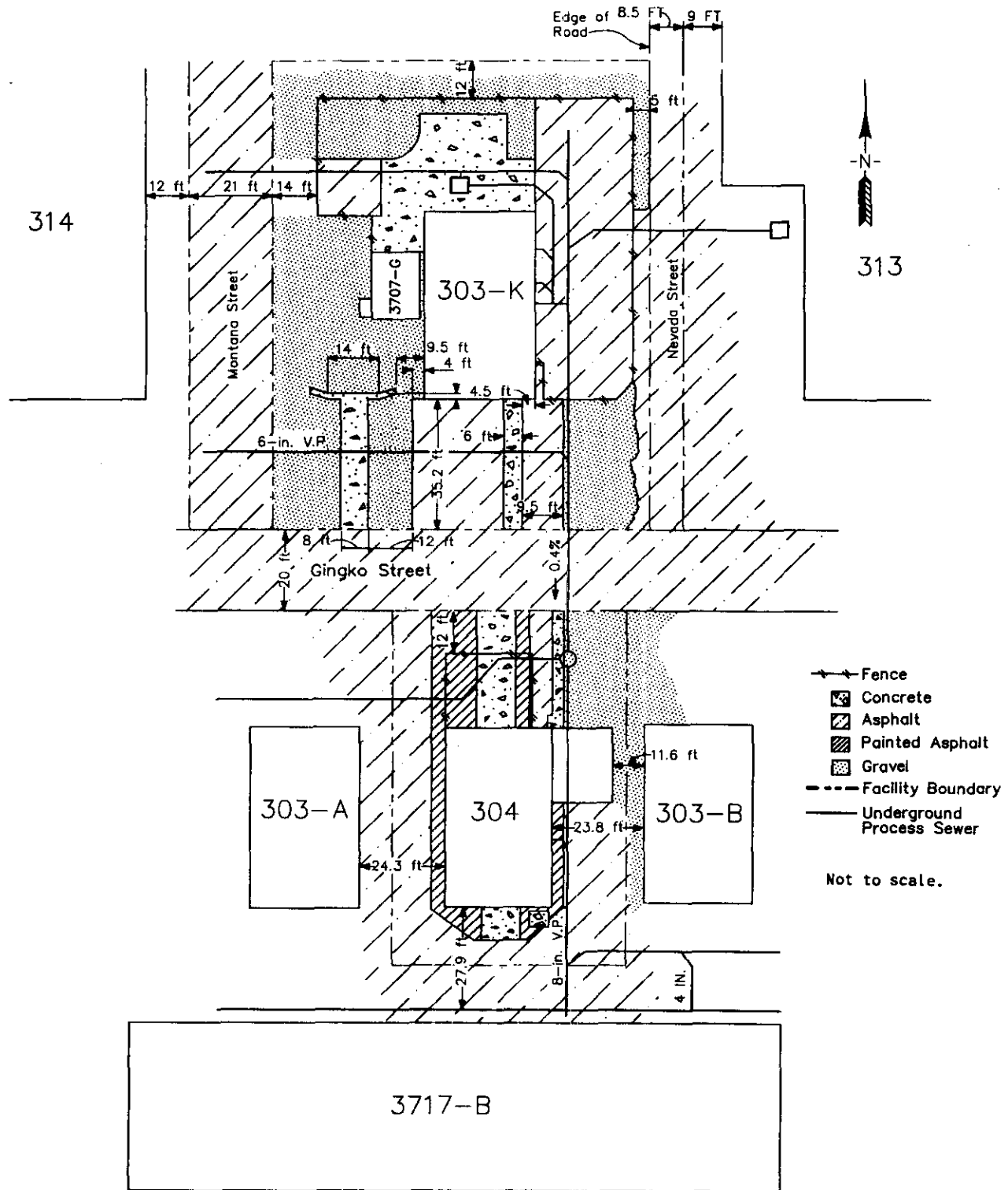
There are a total of 37 sampling locations comprising 12 concrete core, 1 concrete chip, 9 soil, 11 wipe, and 4 asphalt core sampling locations. For the 9 soil sampling locations, samples will be collected at the 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. Table 1 presents a summary of the 304 Facility sampling.

Analysis for inorganics and volatile organics will be performed on the concrete core and soil samples. Separate concrete core samples will be required for the inorganic and volatile organic analysis (VOA). Analysis for inorganics only will be performed on the concrete chip, wipe, and asphalt samples.

5.0 SAMPLING AND FIELD ACTIVITIES

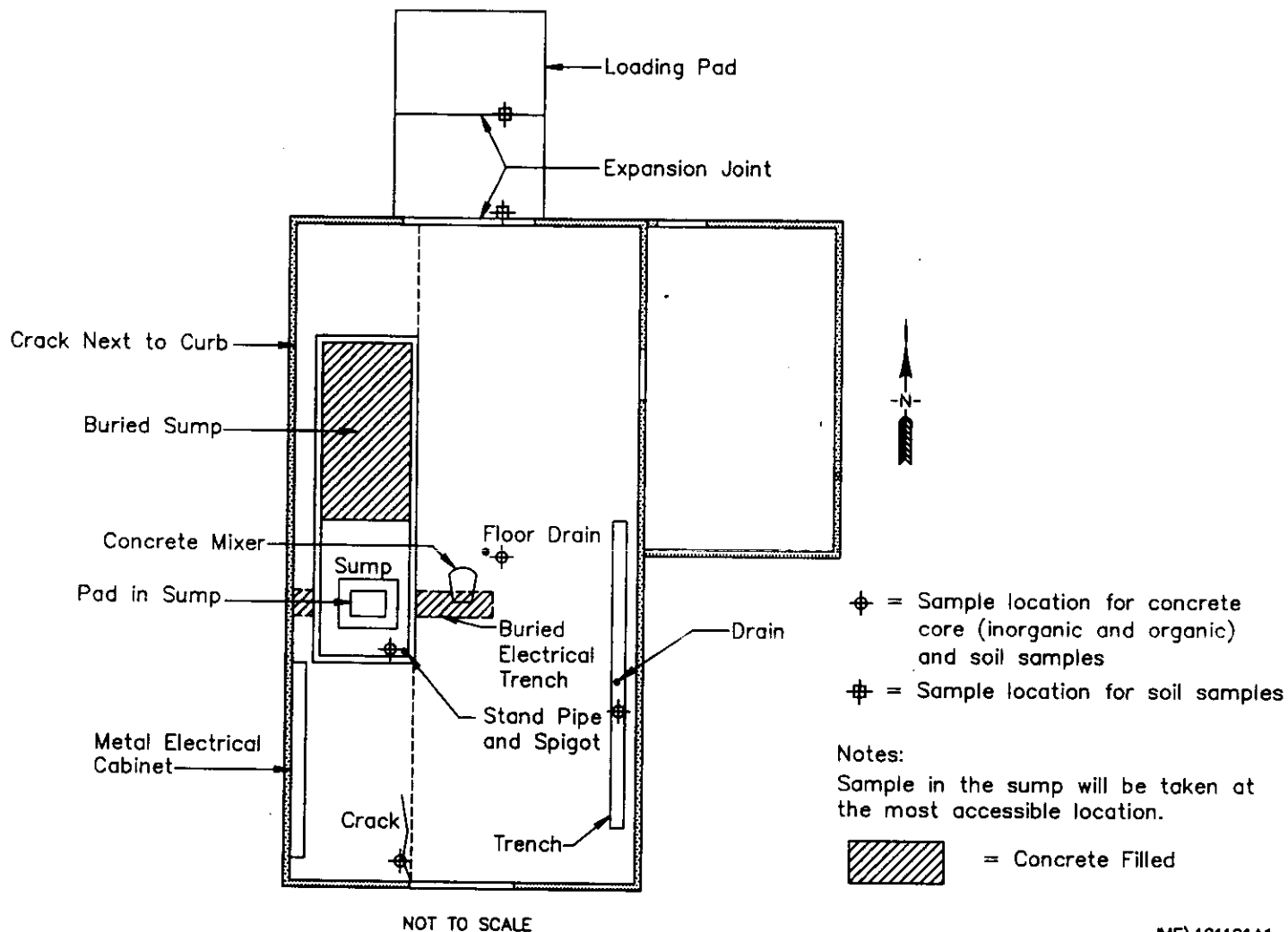
This section discusses the Phase I sampling of the 304 Concretion Facility. Table 1 presents a summary of the sample types and locations.

1 Figure 1. Plan View of 304 Concretion Facility Surrounding Area.



JMF\303K-304

1
2 Figure 2. 304 Concretion facility, Authoritative Concrete Core and Soil Sample Locations in Areas of Potential Contamination.



JMF\101191A1

Table 1. Summary of 304 Concretion Facility Sampling.

Number of sample locations	Sample types	Inorganic sample	Organic sample	Total number of samples
FLOOR				
4	Authoritative Concrete Core	1	1	8
6	Random Concrete Core	1	0	6
1	Random Concrete Core	1	1	2
4	Soil, 0 to 6 inches	1	1	8
	6 to 18 inches	1	1	8
	18 to 24 inches	1	1	8
(Note: Soil samples and Authoritative Concrete Core Samples are co-located.)				
STORAGE PAD				
1	Random Asphalt Core	1	0	1
1	Random Concrete Core	1	1	2
2	Soil, 0 to 6 inches	1	1	4
	6 to 18 inches	1	1	4
	18 to 24 inches	1	1	4
CHANGEROOM FLOOR				
1	Random Concrete Chip	1	0	1
NORTH WALL				
2	Random Wipe	1	0	2
SOUTH WALL				
2	Random Wipe	1	0	2
EAST WALL				
3	Random Wipe	1	0	3
WEST WALL				
3	Random Wipe	1	0	3
GIRDER				
1	Wipe	1	0	1
WEST-SIDE, BUILDING EXTERIOR				
2	Asphalt Core	1	0	2
2	Soil, 0 to 6 inches	1	1	4
	6 to 18 inches	1	1	4
	18 to 24 inches	1	1	4
(Note: Soil samples and Asphalt Core Samples are co-located.)				
EAST-SIDE, BUILDING EXTERIOR				
1	Asphalt Core	1	0	1
1	Soil, 0 to 6 inches	1	1	2
	6 to 18 inches	1	1	2
	18 to 24 inches	1	1	2
(Note: Soil samples and Asphalt Core Samples are co-located.)				

5.1 GENERAL PROCEDURES

The activities associated with implementing this SAP will be conducted in accordance with the following environmental investigations instruction (EII) procedures (WHC 1988):

- EII 1.1, Hazardous Waste Site Entry Requirements
- EII 1.5, Field Logbooks
- EII 1.13, Environmental Readiness Review
- EII 5.1, Chain of Custody
- EII 5.2, Soil and Sediment Sampling
- EII 5.4, Field Cleaning and/or Decontamination of Equipment
- EII 5.5, 1706 KE Laboratory Decontamination of RCRA/*Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Sampling Equipment
- EII 5.10, Obtaining Sample Identification Numbers and Accessing Hanford Environmental Information System Data
- EII 5.11, Sample Packaging and Shipping
- EII 14.1, Analytical Laboratory Data Management.

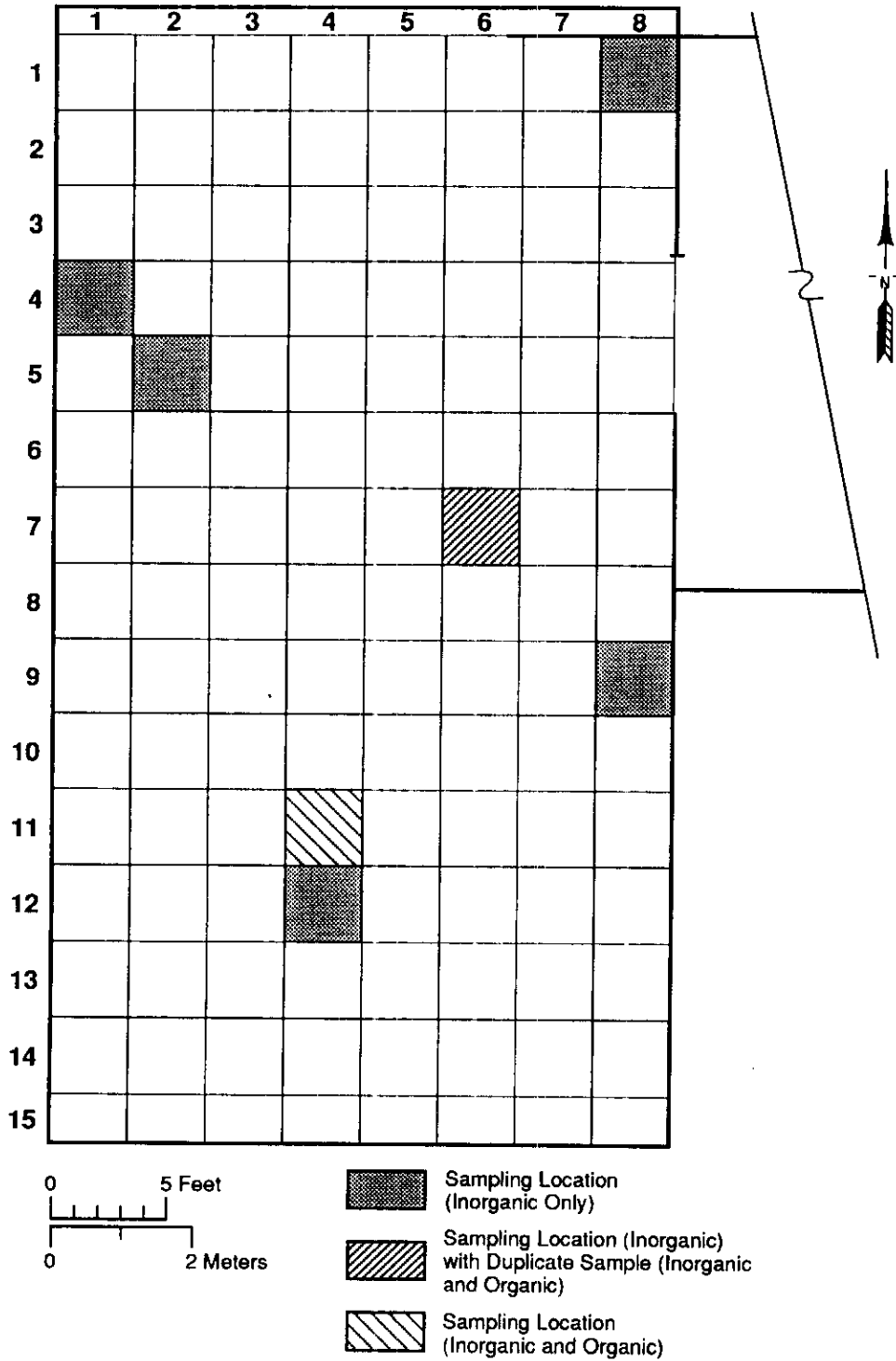
5.1.1 Total Activity Samples

In addition to the samples listed in Sections 5.2 to 5.6, total activity samples are needed to determine radiological dose rates that control the transportation and handling requirements for the samples. Total activity samples will be collected as determined by the Sampling Field Team Leader as needed to support sampling transportation and handling. If a total activity sample is required for a VOA sample, the original VOA sample will not be used and a separate sample will be collected for total activity analysis.

5.1.2 Figures

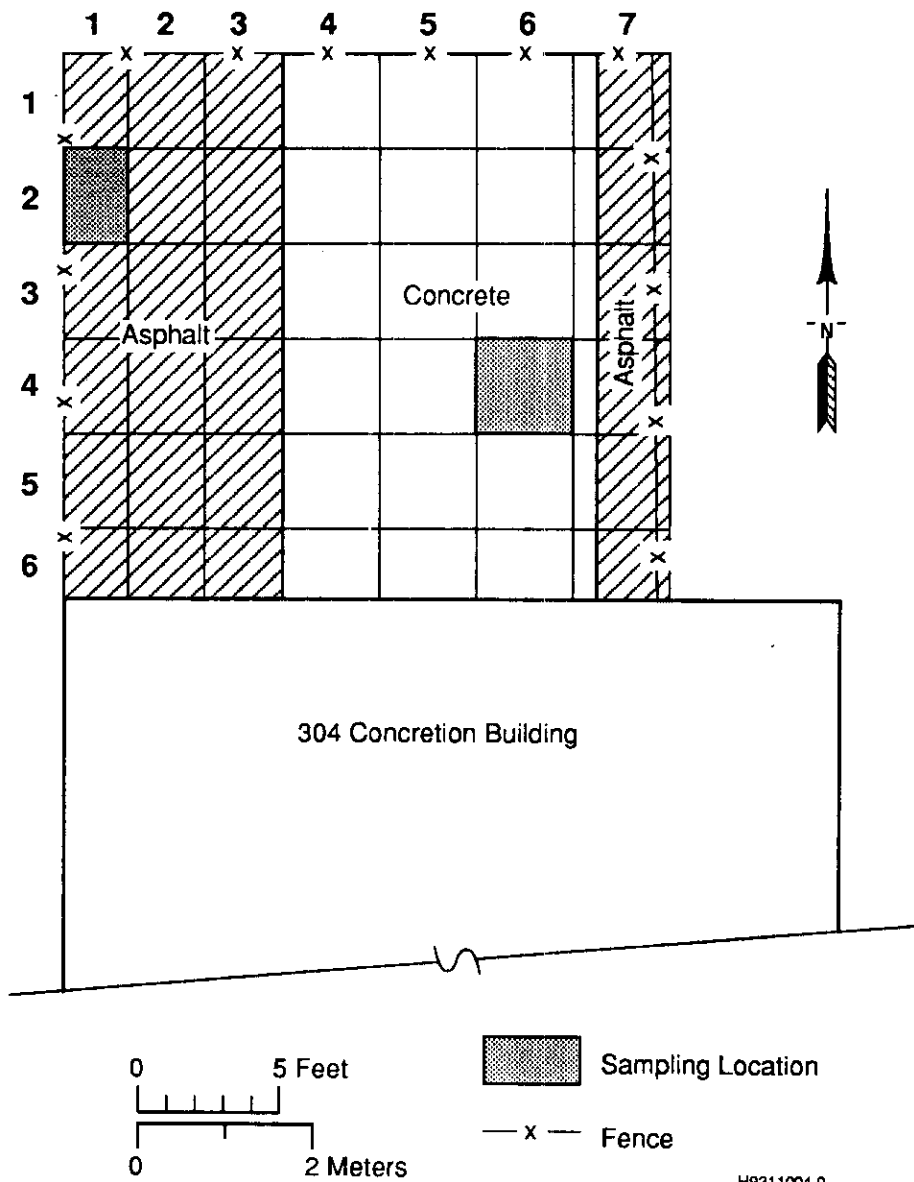
Figures 3 through 9 identify the sampling locations at the 304 Concretion Facility. Sampling methodology and selection of the sampling locations is discussed in the *304 Concretion Facility Closure Plan* (DOE-RL 1993a). Each sampling area (wall or floor) was divided by a 1 meter by 1 meter grid. Random sampling grid locations were then selected from within each area.

Figure 3. 304 Concretion Facility, Building Floor
Concrete Core Sampling Locations.



H9311004.6

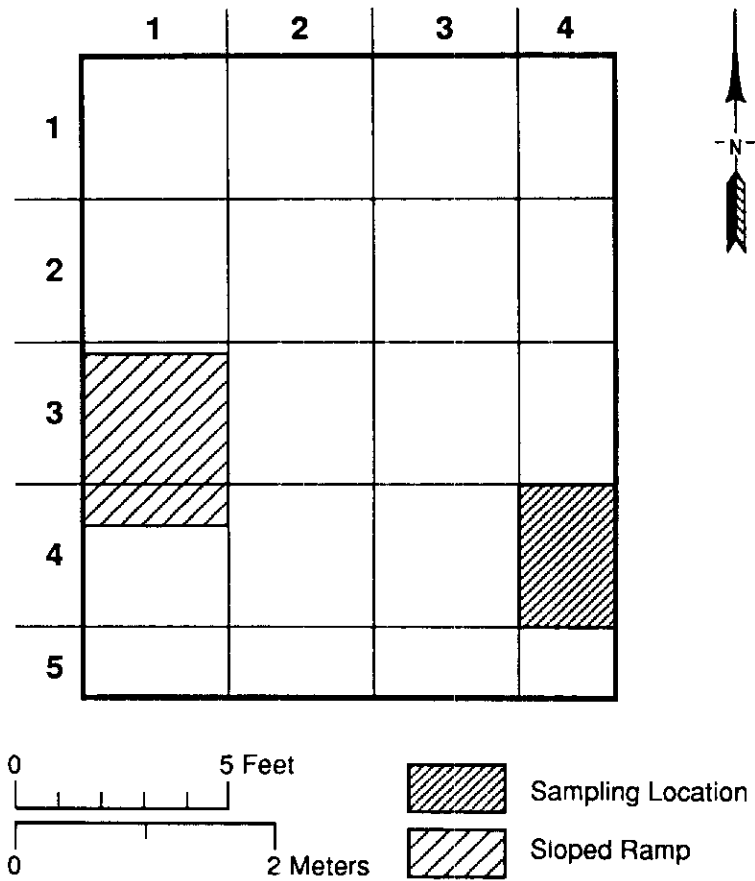
Figure 4. 304 Concretion Facility, Outside Storage Pad Concrete and Asphalt Core Sampling Locations.



H9311004.9

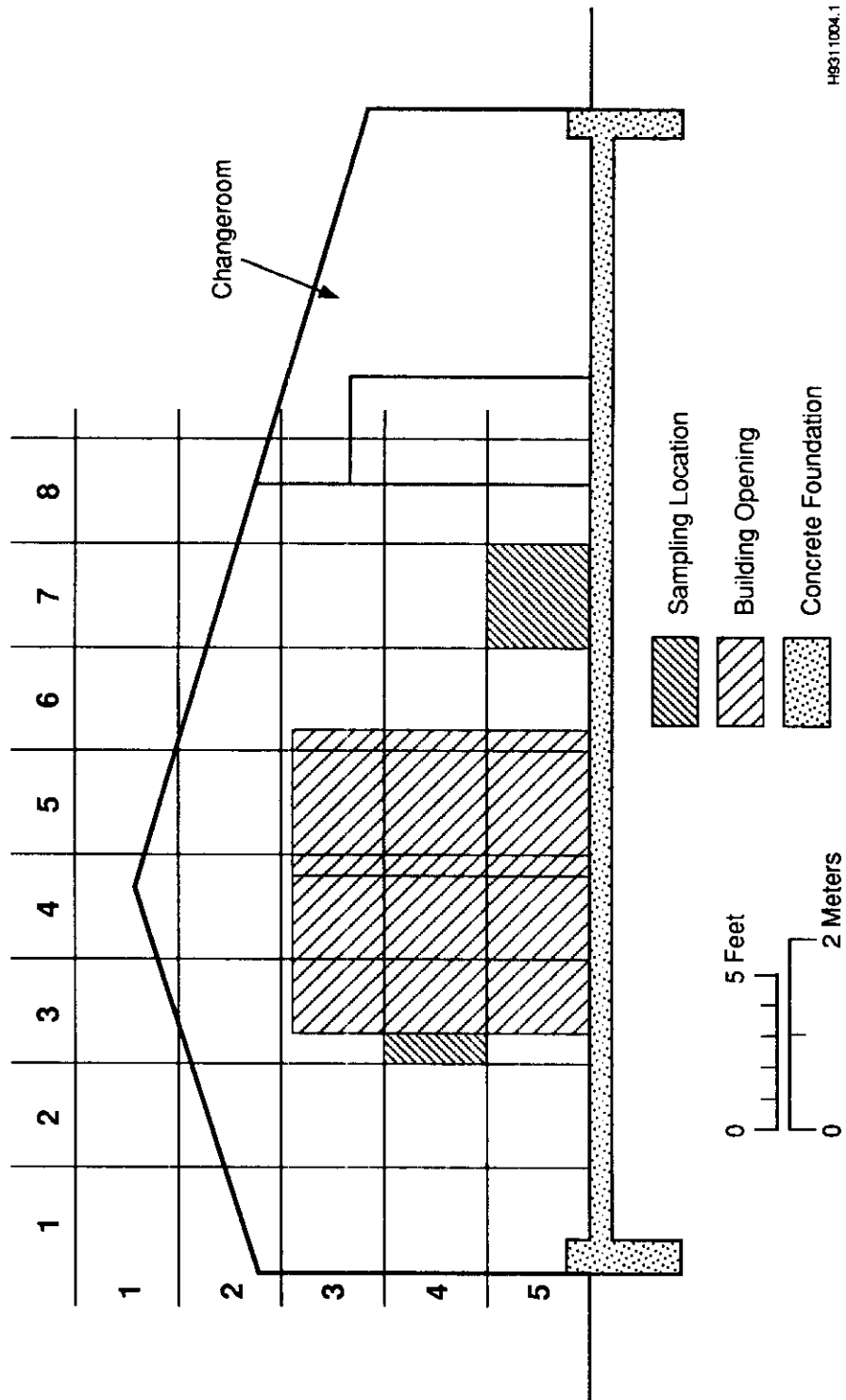
1
2

Figure 5. 304 Concretion Facility, Changeroom Floor
Concrete Chip Sample Location.

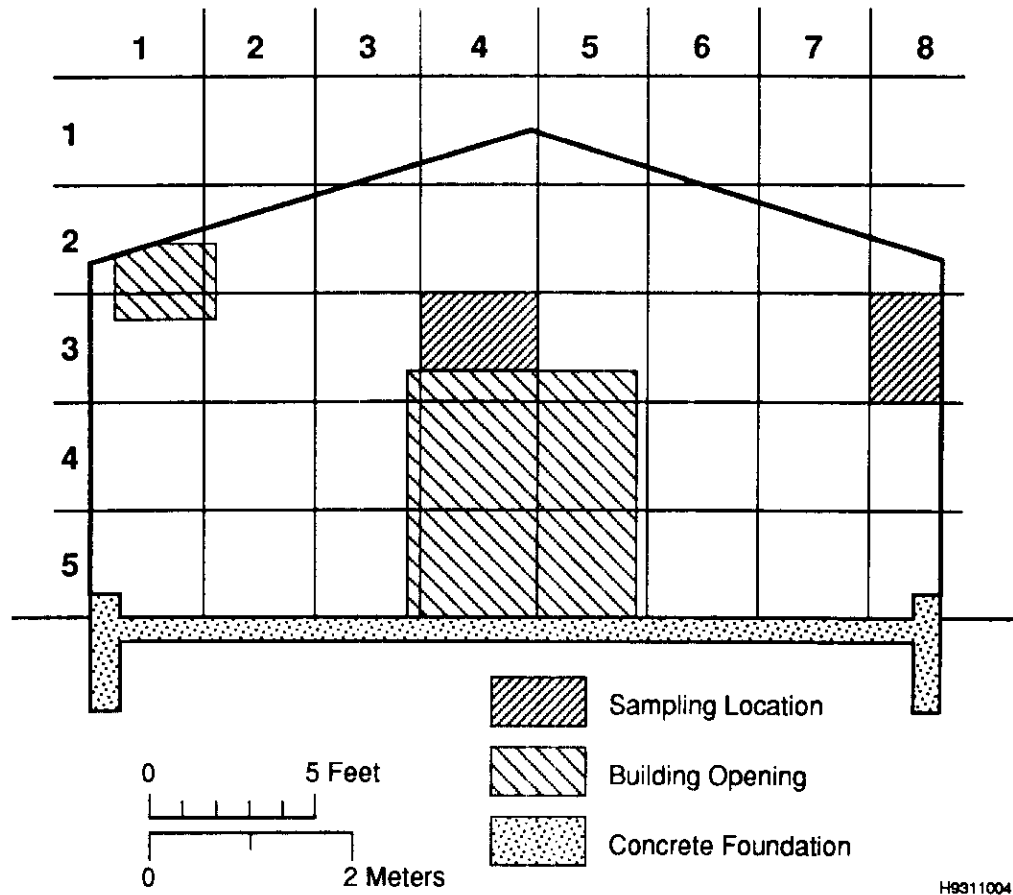


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1 Figure 6. 304 Concretion Facility, North Wall Wipe Sample Locations.

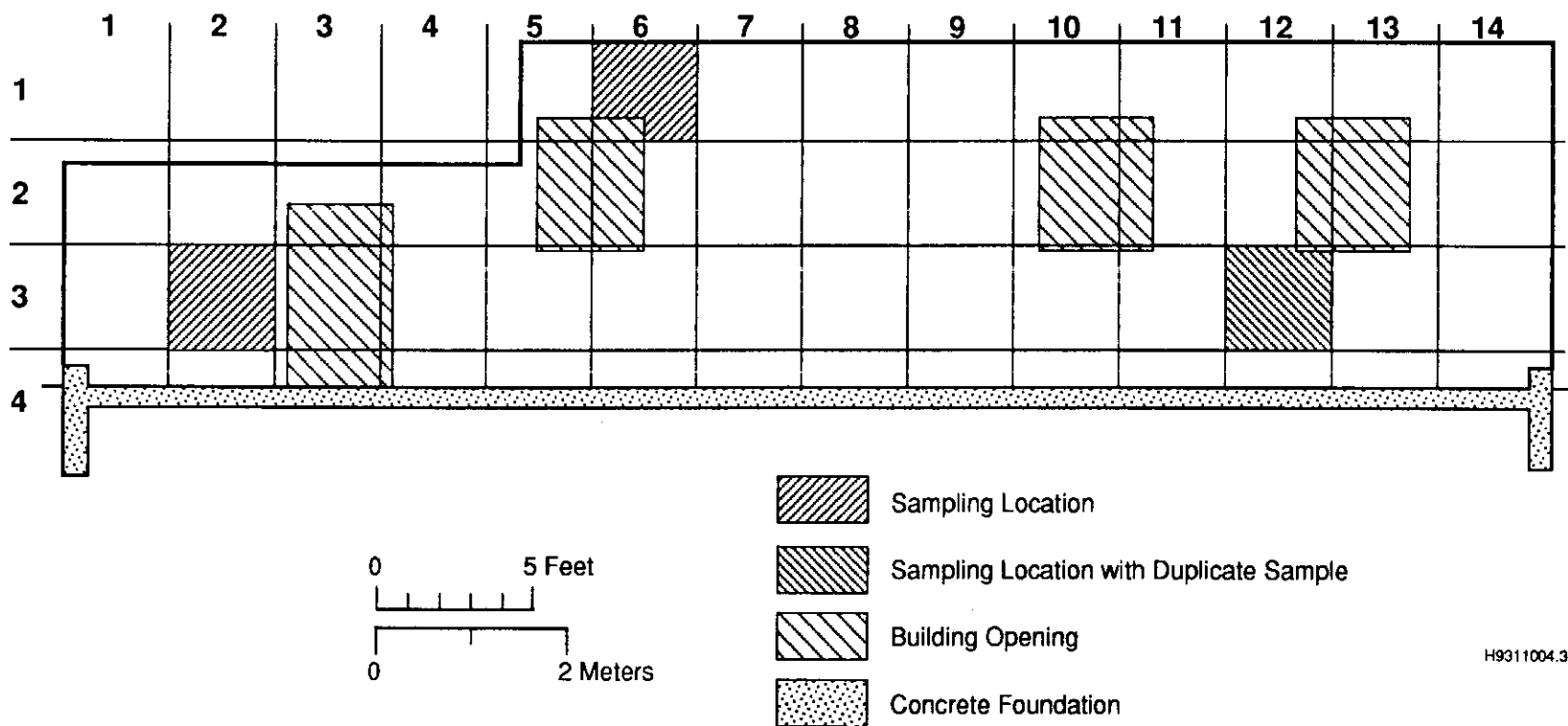


1 Figure 7. 304 Concretion Facility, South Wall Wipe Sample Locations.



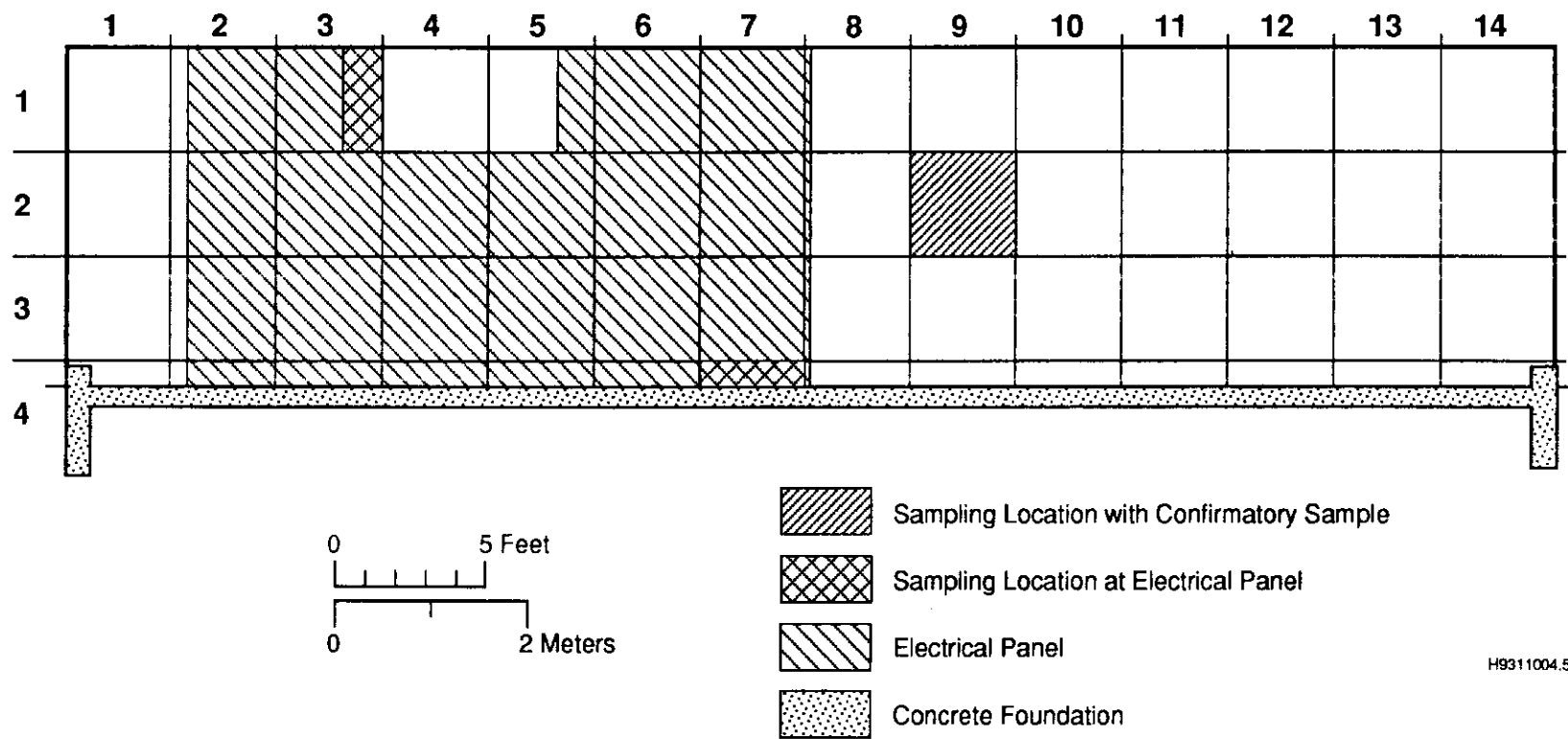
H9311004.2

1 Figure 8. 304 Concretion Facility, East Wall Wipe Sample Locations.



H9311004.3

1 Figure 9. 304 Concretion Facility, West Wall Wipe Sample Locations.



H9311004.5

5.2 CONCRETE CORE SAMPLING

Concrete core samples will be collected at a total of 12 locations. Samples for inorganics analysis will be collected at all 12 locations with VOA samples being collected at only 6 of the 12 locations. The sampling locations for concrete core samples are shown in Figures 2, 3, and 4. Concrete core organic and inorganic samples will be collected from the following locations:

- In the sump (Figure 2)
- In the trench (Figure 2)
- On top of the crack near the south wall (Figure 2)
- Next to the floor drain (Figure 2)
- From the building floor sampling grid 11 south by 4 west (Figure 3)
- From the outside storage pad sampling grid 4 south by 6 west (Figure 4).

The remainder of the samples are concrete core inorganic samples that will be collected from the building floor sampling grid locations shown in Figure 3.

The recommended core size is 4 inches. Other core sizes may be used to meet sampling conditions. The cores will be taken from the center area of each sampling grid. Separate cores will be collected for inorganics analysis and VOA. The cores will be taken in a manner that minimizes any overlap with other core samples.

The appropriate containers and lids (i.e., compatible) will be used for the concrete core VOA samples. Sealable plastic bags may also be used if the concrete cores cannot fit into a jar-type container. The type of container used will be recorded in the field logbook.

There is no SW-846 method for collecting samples from concrete. The sampling method or technique used will be identified and recorded in the field logbook. The water used in coring will be vacuumed and containerized to minimize cross-contamination and displacement of volatiles.

5.3 CONCRETE CHIP SAMPLING

Concrete chip samples will be collected at one location for inorganics analysis. The sampling location for the concrete chip sample is shown in Figure 5. The chips will be collected from the center of the sampling grid to a depth of approximately 3/8 inch. The appropriate containers and lids (i.e., compatible) will be used for the concrete chip samples.

There is no SW-846 method for collecting chip samples from concrete. The sampling method or technique used will be identified and recorded in the field logbook.

5.4 SOIL SAMPLING

Soil samples will be collected at a total of nine locations for VOA and inorganics analysis. Four of the samples are co-located with the authoritative concrete core samples taken from the floor of the facility, as shown in Figure 2. Two of the soil sample locations are located on the storage pad, as shown in Figure 2, with one each being taken by coring through the concrete at the north and south expansion joints. The remaining three soil samples are co-located with the asphalt samples from the east and west sides of the building (Section 5.6). The appropriate containers and lids (i.e., compatible) will be used for the soil VOA samples.

Most of the samples will be collected through the holes that result from the concrete and asphalt coring operations. The concrete sampling is expected to leave several holes in the concrete. A hole or holes specifically for soil sampling will need to be drilled through the concrete at the expansion joints shown in Figure 2. The Sampling Field Team Leader will determine the number of holes that need to be drilled to collect the soil samples at the expansion joints.

When possible, a different concrete core hole will be used for each level and type (VOA or inorganic) of soil sample. The samples will be collected at intervals of 0 to 6 inches, 6 to 18 inches, and 18 to 24 inches. At each interval, one VOA sample and one inorganic analysis sample will be collected. Hand tools will be used to collect the soil samples.

5.4.1 Additional Requirements for the Collection of VOA Soil Samples

No deviations are permitted from the requirements of this section. The VOA soil samples will be collected as soon as possible after the concrete core samples have been collected. Volatile organic analysis soil samples will be collected the same day that the concrete cores are drilled. At any given sampling interval, the VOA soil sample will be collected before the inorganics sample. The VOA samples will be collected so that there is minimum or no headspace in the containers. Mixing or homogenizing of the material comprising the VOA sample is not allowed.

5.5 WIPE SAMPLING

Wipe samples will be collected at a total of 11 locations (10 wall and 1 girder) for inorganics analysis. Figures 6, 7, 8, and 9 show the locations of the 10 wall samples for inorganics analysis. The one girder wipe sample is to be collected from the top of one girder directly above the area where the concretion process was located and where the fire occurred. As viewed from Figure 2, the boundaries of this area are defined as follows:

- north boundary - an east-west line at the floor drain
- east boundary - a north-south line 8 feet east of the building center line

- south boundary - an east-west line 10 feet from the south wall
- west boundary - a north-south line 8 feet west of the building center.

The specific girder will be chosen at the discretion of the Sampling Field Team Leader and identified in the field logbook.

5.5.1 Wipe Sampling Methodology

The general wipe sampling methodology presented in *A Compendium of Superfund Field Operations Methods* (EPA 1987) will be used. Wipe sampling of surfaces will be performed by wiping a 100-square-centimeter area using Whatman No. 42¹ filter paper or equivalent. The filter papers will be laboratory-prepared with toxicity characteristic leaching procedure (TCLP) extraction fluid number 2 and containerized in individual glass containers. The TCLP extraction fluid number 2 will be prepared as specified in Section 5.7.2 of SW-846 Method 1311. (Note: The TCLP extraction fluid is only being used as a solvent for wipe sampling. No TCLP analysis will be performed.)

The interior walls have been divided into 1-square-meter sample grids (Figures 6, 7, 8, and 9). One filter paper will be used to wipe the wall surface from a 100-square-centimeter section within each sample grid. The entire 100-square-centimeter area within a disposable template will be carefully covered, using vertical strokes, starting at one end and progressing to the other end (Figure 10). The filter paper will be held using clean gloves to prevent contamination. A new pair of gloves will be used for each wipe sample. Care will be taken to wipe the surface only once throughout the sampling effort.

The top of the one steel girder chosen for sampling will be wipe sampled using the same technique as described previously. One 100-square-centimeter area will be wipe sampled.

After the area is wiped, the filter paper will be folded with the exposed side in, and then folded over to form a 90-degree angle in the center of the filter. The filter then will be returned to the original glass container, angle first, and immediately sealed.

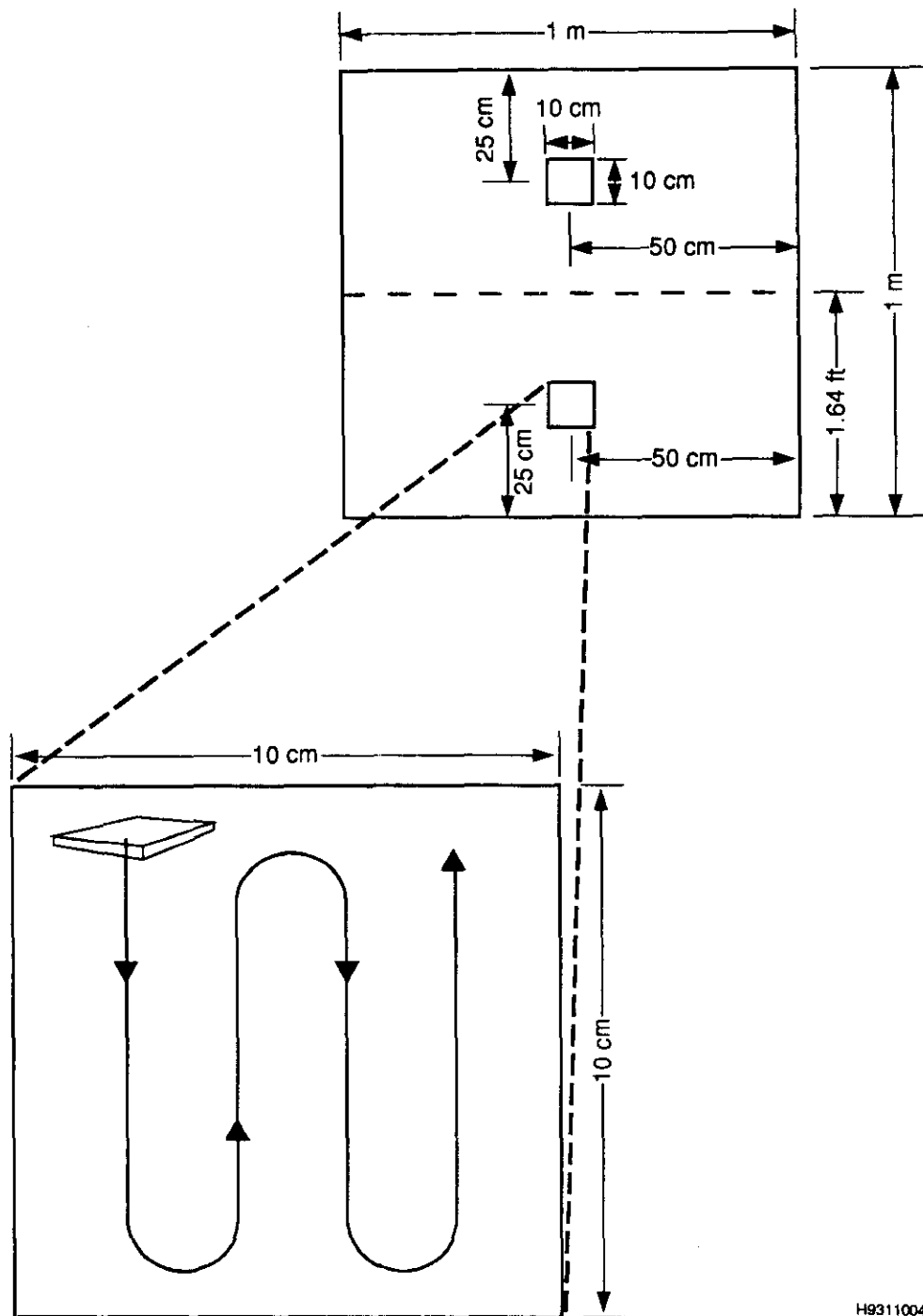
5.6 ASPHALT CORE SAMPLES

Asphalt core samples will be collected at a total of four locations for inorganics analysis. One asphalt core sample will be collected from a location on the outside storage pad (Figure 4). In addition, two asphalt core samples will be obtained from the west side of the 304 Building and one from the east side. The exact sampling locations will be determined at the time of sampling, and will be taken in places where contamination is most likely to have occurred (e.g., cracks, asphalt joints, visible stains). The specific locations will be chosen at the discretion of the Sampling Field Team Leader

¹Whatman No. 42 is a trademark of Whatman, Incorporated.

1

Figure 10. Wipe Sampling Technique.



H9311004.10

and identified in the field logbook. The recommended core size is 4 inches. Other core sizes may be used to meet sampling conditions. The cores will be taken in a manner that minimizes any overlap with other core samples. Sealable plastic bags may also be used if the asphalt cores cannot fit into a jar-type container.

There is no SW-846 method for collecting core samples from asphalt. The sampling method or technique used will be identified and recorded in the field logbook. The water used in coring will be vacuumed and containerized to minimize cross-contamination and displacement of volatiles.

6.0 QUALITY CONTROL SAMPLES

This section identifies the quality control samples for the sampling effort at the 304 Concretion Facility.

6.1 GENERAL INFORMATION

Field quality control samples will be collected by the sampling team and documented in the sampling logbook in accordance with EII 1.5, "Field Logbooks" (WHC 1988). Deionized water will be used for the field and equipment blanks because it provides the excellent sensitivity to contamination. Table 2 presents a summary of the quality control samples for the 304 Concretion Facility. While the number of samples is sufficient to determine if the 304 Facility can be clean-closed, there is not a sufficient number of samples for a detailed statistical analysis.

6.1.1 Duplicate Samples

Duplicate samples are included for each type of sample (concrete core inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic, soil VOA, and wipe). The purpose of the field duplicate samples is to indicate the precision of sampling and analysis.

Duplicate samples are collected from the same location and using the same methods or techniques as a regular sample, but placed in a separate container.

6.1.2 Equipment Blanks

Equipment blanks are included for each type of sample (concrete core inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic, soil VOA, and wipe). The purpose of the equipment blanks is to check for sampling device cleanliness from the laboratory decontamination efforts.

The equipment blanks for concrete core, concrete chip, asphalt core, and soil samples are collected using deionized water transported to the sampling site. At the site, the deionized water is poured over or through the sample collection device, collected, and returned for analysis.

Table 2. Summary of 304 Concretion Facility Routine and Quality Control Samples.

SAMPLE TYPES	Concrete Core ¹	Concrete Chip	Soil			Wipe ²	Asphalt
NUMBER OF SAMPLE LOCATIONS	12	1	9			11	4
SAMPLING INTERVALS (depth in inches)	na	na	0 to 6	6 to 18	18 to 24	na	na
NUMBER OF SAMPLES							
Inorganic Analysis	12	1	9	9	9	11	4
Organic Analysis	6	na	9	9	9	na	na
DUPLICATE SAMPLES							
Inorganic Analysis	1	1	1	1	1	1	1
Organic Analysis	1	na	1	1	1	na	na
EQUIPMENT BLANK ⁴ (Inorganic Analysis)	V5	na	V5			1	V1
CONFIRMATORY WIPE SAMPLE (Inorganic Analysis)	na	na	na			1	na
FIELD BLANKS ⁵ (Inorganic Analysis)	V5	na	V5			V1	V3

NOTES:

¹Includes both the 4 authoritative and the 8 random concrete core samples.²Includes both the 10 random wipe samples and the 1 wipe sample from the girder.³Includes both the 1 random asphalt sample and the 3 asphalt core samples.⁴Frequency for each sample type: 1 per day of sampling and 1 after each time sampling equipment undergoes field decontamination.⁵Frequency for each sample type: 1 per day of sampling or for each 20 samples collected.

na = not applicable.

V1 = Number of samples is variable; 1 expected, covering an estimated 1 day of sampling.

V3 = Number of samples is variable; 3 expected, covering an estimated 3 days of sampling.

V5 = Number of samples is variable; 5 expected, covering an estimated 5 days of sampling.

1 The equipment blanks for wipe samples consist of filter paper saturated
2 with TCLP extraction fluid number 2. They remain sealed while in the field
3 and are returned for analysis. Additional details are provided in
4 Section 6.5.

6.1.3 Field Blanks

9 Field blanks will only be taken if field decontamination procedures are
10 used. The purpose of the field blanks is to check the effectiveness of the
11 field decontamination procedures to determine if there is contamination
12 originating in the sampling environment.

14 Field blanks for any field decontaminated equipment are collected by
15 pouring deionized water over or through the sampling device. Then the sample
16 is returned for analysis.

18 Field blanks for the wipe samples will be collected by removing the
19 filter paper (saturated with TCLP extraction fluid number 2) from the
20 container. The filter paper is then exposed to air for the same amount of
21 time required to collect a wipe sample, then returned to the original sample
22 container.

6.1.4 Trip Blanks

27 Trip blanks will not be included for the VOA samples. The reasons for
28 their exclusion are the following.

- 30 • Neither sand nor deionized water is a suitable medium for a trip blank
31 for soil. Sand has little to no affinity for adsorbing volatile
32 organics. Water absorbs organics, whereas soil primarily adsorbs
33 organics; because the mechanism is different, water is not a suitable
34 material for the trip blanks.
- 36 • The field and equipment blanks will 'trip' with the routine samples
37 and will contain any volatile contamination that may be present.

6.2 CONCRETE CORE FIELD QUALITY CONTROL SAMPLES

42 The quality control requirements for concrete core samples are as
43 follows.

- 45 • One duplicate concrete core sample will be collected for inorganic
46 analysis. The sample will be collected from the random sample
47 location shown in Figure 3.
- 49 • One duplicate concrete core sample will be collected for VOA. The
50 sample will be collected from the random sample location shown in
51 Figure 3.

- One equipment blank (deionized water) will be collected for inorganic analysis per day of sampling.
- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

The cores will be collected as close to each other as possible.

6.3 CONCRETE CHIP FIELD QUALITY CONTROL SAMPLES

The quality control requirements for concrete chip samples are as follows.

- One duplicate concrete chip sample will be collected for inorganic analysis. The sample will be collected from the random sample grid location shown in Figure 5.
- One equipment blank (deionized water) will be collected for inorganic analysis per day of sampling.
- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling.

6.4 SOIL FIELD QUALITY CONTROL SAMPLES

The quality control requirements for soil samples are as follows.

- Three duplicate soil samples will be collected for VOA. Duplicate soil samples will be collected at 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. The sample will be collected from the sump sampling location shown in Figure 2. This location was chosen because it has a greater potential for volatile organics contamination.
- Three duplicate soil samples will be collected for inorganic analysis. Duplicate soil samples will be collected at 0 to 6-inch, 6 to 18-inch, and 18 to 24-inch intervals. Each duplicate sample will be collected on different sampling days. One of the samples will be collected from the floor drain sampling location shown in Figure 2. The other two samples will be collected from locations determined by the Sampling Field Team Leader and the locations recorded in the field logbook.
- One equipment blank (deionized water) will be collected for inorganic analysis per sampling day.
- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

6.5 WIPE FIELD QUALITY CONTROL SAMPLES

The quality control requirements for wipe samples are as follows.

- One duplicate wipe sample will be collected for inorganic analysis. The duplicate will be collected from a 100-square-centimeter area adjacent to the original sample, i.e. within the 1-square-meter sample grid. The sample will be collected from the random sample grid location shown in Figure 8.
- One equipment blank (clean filter paper saturated with TCLP extraction fluid number 2) will be collected for inorganic analysis. This sample will remain sealed during the sampling event and the filter paper will not be handled in the field.
- One field blank (using clean filter paper saturated with TCLP extraction fluid number 2) will be collected per day of wipe sampling or for each 20 samples. The filter paper will be removed from the container (with the sampler wearing clean gloves) and exposed to air for the same amount of time required to collect a wipe sample.

In addition to the quality control samples listed, one confirmatory wipe sample will be collected. This sample will only be taken once during the sampling of the 304 Concretion Facility. The purpose of this sample is to determine if wipe samples are effective.

- One confirmatory wipe sample will be collected for inorganic analysis. The confirmatory sample will be collected from the same 100-square-centimeter area as the original wipe sample. The sample will be collected from the random sample grid location shown in Figure 9.

6.6 ASPHALT CORE FIELD QUALITY CONTROL SAMPLES

The quality control requirements for asphalt core samples are as follows.

- One duplicate asphalt core sample will be collected for inorganic analysis. The sample will be collected from the same sample location as the asphalt core sample collected on the outside east of the building (Section 5.6).
- One equipment blank (deionized water) will be collected for inorganic analysis per day of sampling.
- If field decontamination procedures are used, one field blank will be collected after decontamination. One field blank (using deionized water) will be collected per day of sampling or for each 20 samples.

The cores will be collected as close to each other as possible.

7.0 LABORATORY ANALYSIS

Laboratory analysis will be performed on the samples to determine the concentration and, for wipe samples, the amount of the constituents of concern that remain at the 304 Facility after decontamination.

7.1 CONSTITUENTS OF CONCERN

The samples to be analyzed for inorganic constituents are as follows.

- concrete core inorganic samples
- soil inorganic samples
- asphalt samples
- concrete chip samples
- wipe samples.

The inorganic constituents of concern are as follows.

- Beryllium
- Cadmium
- Chromium
- Lead
- Nickel
- Uranium.

The samples to be analyzed for volatile organic constituents are as follows.

- concrete core organic samples
- soil organic samples.

The volatile organic constituents of concern are as follows.

- Trichloroethylene
- Tetrachloroethylene
- 1,1,1-Trichloroethane
- 1,1-Dichloroethylene
- cis-1,2-Dichloroethylene
- trans-1,2-Dichloroethylene
- Ethyl acetate
- Methyl ethyl ketone.

The analytical methods are identified in Section 7.5.

7.2 SAMPLE PREPARATION FOR CONCRETE CORE, CONCRETE CHIP, AND ASPHALT CORE INORGANIC SAMPLES

Before the concrete core, concrete chip, and asphalt core samples can be analyzed for inorganics, it may be necessary to crush or break-up the samples to reduce the size of the material sent for analysis. Size reduction may

1 occur in either the field or the laboratory. If size reduction occurs in the
 2 field, the sample number, technique used for reduction, and any other
 3 pertinent or relevant information, will be documented in the field logbook.

6 7.3 SAMPLE PREPARATION FOR CONCRETE ORGANIC SAMPLES

8 The preparation of the concrete organic samples will be performed at the
 9 222-S Analytical Laboratory. Before the concrete cores can be analyzed for
 10 volatile organics, additional laboratory preparation is required. Before
 11 analysis, the concrete core will be handled according to *Preparation of*
 12 *Concrete for Volatile Organics Analysis*, (WHC 1994). The resulting extractant
 13 from each sample will be analyzed at the 222-S Analytical Laboratory for
 14 volatile organics in accordance with Section 7.5.

17 7.4 SAMPLE PREPARATION FOR WIPE SAMPLES

18 Before the wipe samples can be analyzed for inorganics, additional
 19 laboratory preparation is required. Each wipe sample will be handled
 20 according to *Acid Digestion of Sediments, Sludges, and Soils*, SW-846
 21 Method 3050 (EPA 1986). The resulting extractant from each sample will be
 22 analyzed for inorganics in accordance with Section 7.5.

26 7.5 ANALYTICAL METHODS

27 The SW-846 analytical methods (EPA 1986) will be used for the sample
 28 analysis, except for uranium. The uranium results will be determined by
 29 SCINTREX UA-2 laser method², Eastern Environmental Radiation Facility
 30 Method 00.07 (EPA 1984) or Laser Kinetic Phosphorimetric Analysis. The
 31 inorganics analysis methods are as follows:

- 34 • Method 6010, Inductively coupled plasma-atomic emission spectroscopy
 35 (analysis will be for the target analyte list. Except for lead, this
 36 list includes the inorganic constituents of concern listed in
 37 Section 6.1) (This method addresses the following constituents of
 38 concern: beryllium, cadmium, chromium, and nickel.)
- 39 • Method 7421, Lead (Atomic Absorption, Furnace Technique). (This
 40 method addresses the following constituent of concern: lead.)
- 41 • SCINTREX UA-2 laser method, EERF Method 00.07, or Laser Kinetic
 42 Phosphorimetric Analysis. (This method addresses the following
 43 constituent of concern: uranium.)

46 ²SCINTREX is a trademark of SCINTREX, Incorporated.

The VOA methods are as follows:

- Method 8260, Volatile organic compounds by gas chromatograph/mass spectroscopy capillary column technique. (This method addresses the following constituents of concern: trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and ethyl acetate. Ethyl acetate is not included as a target analyte in the most current revision (Revision 0, July 1992) of Method 8260. However, ethyl acetate can be identified by Method 8260 as a tentatively identified compound. If ethyl acetate is found in an estimated concentration approaching the clean-up level, further sampling and quantitative analysis will be performed if directed by Ecology.)
- Method 8240, Volatile organics by gas chromatography/mass spectrometry. (This method addresses the following constituent of concern: methyl ethyl ketone.)

7.6 DATA REQUIREMENTS FOR THE ANALYTICAL LABORATORIES

The 222-S Laboratory is required to record and provide sufficient data in the performance of any preparation and analysis of the concrete VOA samples to support the data validation described in Section 8.0. The contract laboratory is required to supply stand-alone data packages to support full data validation.

7.7 BATCHING OF INORGANIC SAMPLES

The inorganic samples will be batched for analysis, providing holding times are not violated. The inorganic samples consist of 12 concrete core inorganic, 27 soil inorganic, 11 wipe, 1 concrete chip, and 4 asphalt core samples and the associated quality control samples. The concrete core organic and soil organic samples will not be batched.

8.0 DATA VALIDATION

Data validation will be conducted to Level D as defined in the *Data Validation Procedures For Radiological Analysis* (WHC 1993a) and *Data Validation Procedures For Chemical Analyses* (WHC 1993b), as appropriate. Level D validation consists of the following:

- verification of required deliverables
- verification of requested versus reported analyses
- verification of transcription errors

- evaluation and qualification of results based on analytical holding times
- matrix spikes
- laboratory control samples (radiological samples only)
- laboratory duplicates
- analytical method blanks
- chemical recoveries
- tracer recoveries
- surrogate recoveries
- initial and continuing instrument calibrations
- quench monitoring
- counting instrument resolution checks
- calculation checks.

There will be 100 percent validation of the data because of the small size of the sample set and that similar types of samples (e.g., all wipe samples) can be batch analyzed at the analytical laboratory.

9.0 REFERENCES

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- EPA, 1984, *Eastern Environmental Radiation Facility Radiochemistry Procedures Manual*, 520/5-84/006, U.S. Environmental Protection Agency/Eastern Environmental Radiation Facility, Montgomery, Alabama.
- EPA, 1986, as amended, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd Edition, U.S. Environmental Protection Agency, Washington, D.C.

- 1 EPA, 1987, *A Compendium of Superfund Field Operations Methods*,
2 EPA/540/P-87/001, Office of Emergency and Remedial Response,
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4
5 *Resource Conservation and Recovery Act of 1976*, 42 USC 6901 et seq.
6
7 WAC 173-303, "The Dangerous Waste Regulations," *Washington Administrative*
8 *Code*, as amended.
9
10 WAC 173-340, "The Model Toxics Control Act Cleanup Regulations," *Washington*
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13 WHC, 1988, *Environmental Investigations and Site Characterization Manual*,
14 WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.
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19 WHC, 1993b, *Data Validation Procedures For Chemical Analysis*,
20 WHC-SD-EN-SPA-002, Westinghouse Hanford Company, Richland, Washington.
21
22 WHC, 1994, *Preparation of Concrete for Volatile Organics Analysis*, LA-523-435,
23 Westinghouse Hanford Company, Richland, Washington.

METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			Mass (weight)		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			Volume		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

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